# INDEX OF SUBJECTS.

#### ABSTRACTS. 1890.

And also to Transactions, 1890 (marked TRANS.); and to such papers as appeared in the Proceedings during the Session 1889—1890 (Nos. 72 to 86; Nov., 1889 to July, 1890), but not in Transactions (marked Proc.).

A. Abies excelsa, colouring matters of the cones of, 641. Absorption of fat, 1171. of ultra-violet rays by derivatives of the paraffins, 434. Acenaphthenecarboxylamide, 158. Acetaldehyde, action of hydrogen sulphide on, 478. condensation of, with succinic acid, 584. Acetamide, dichlor-, 490. - dichlorobrom-, 489. thermochemistry of, 1360. Acetamidodiphenyl sulphide, Acetamidophenylhydrazine, ortho-, 150. Acetanilide, brom-, 268. – 1-2-3-dinitro-, 885. - 1-3-4-dinitro-, 887. - 1-3-6-dinitro-, 886. testing, 1349. thermochemistry of, 1360. Acetanilidoacetic acid, 1415. Acetanilidopropionic acid,  $\alpha$ -, 1160. Acetaniside, dinitro-, 751. Acetic acid, chlor-, preparation of, 234. electrochemistry and thermochemistry of, 99. - --- trichlor-, as a test for albumin, 312. vapour density of, 1365. vapour pressure of solutions in, 554. anhydride, decomposition of, by water, 359. - chloride, preparation of, 234. - fermentation, action of light on,

Acetic-series, new acid of, 1395.

Acetic-series of acids, dispersive power Acetoacetic acids, behaviour of ethereal salts of alkyl-substituted, with ammonia, 1097. Acetobenzoylphosphinous acid, 619. Acetocamphenylcarboxylic acid Acetoethenyl- $\beta$ -naphthenylazoxime, 63. Acetohydroxamic acid, 127. Acetol, Proc., 1889, 156. Acetometanitrobenzoic anhydride, 53. Aceto-α-naphthol, 376. Acetone, absence of, in healthy urine. action of ammonium formate on, 784. — action of nitrogen iodide on, 1402. - action of sodium on, 956. - and benzoïn, compound from. TRANS., 783. estimation of, as iodoform, 837. - estimation of, in methyl alcohol, &c., 837. tetrachloro-, derivatives of, 232. tetrachlorobrom-, 489. – thio-, 26. Acetonebenzile, preparation of, Trans., 673.  ${f A}$ cetoneberberine, 1011. Acetone-chloroform, reactions and derivatives of, 959. Acetonediacetic acid, 30. Acetonedinitrophenylhydrazone, 40. Acetone-ethylenephenylhydrazine, 251. Acetonenitrophenylhydrazine, 151. Acetonitrile, benzoyl-derivatives of, 1251. Acetonuria and diabetic coma, 399. Acetonylacetonemethylphenyldihydr-

azone, 24. Acetonylacetoxime, 364. Acetoparatoluidide, brom-, 269. Acetoparatoluidoacetic acid, 415. Acetophenone, oxidation of, by alkaline permanganate, 1416. Acetophenoneacetonedioxime, 1155. Acetophenonecarboxylanilide, chlor-. Acetophenone carboxylicacid, chlor-, 786. Acetophenonenitrophenylhydrazine, Acetorthamidoquinoline, 1324. Acetotoluidide, chlor-, 1285. Acetovaleric acid, Trans., 230. Aceto-xylidide, parabrom-, 269. Acetylacetone, chloro-derivatives of, --- heptabrom-, 1110. --- hexachlorodibrom-, 489. -- octochlor-, 489. --- perbrom-, 1108. Acetylacetonemethylphenylhydrazine, Acetyl-ω-amidoethylpiperonylcarboxylic anhydride, Trans., 1016. Acetylanhydroberberilic acid, TRANS., Acetylanisoïl, para-, 963. Acetyl-\beta-benzoylmetanitrophenylhydrazine, a-, 150. Acetylbrazileïn, dibrom-, 997. Acetylbromothymol, 366. Acetylcarbinol, Proc., 1889, 156. Acetylcotarnelactone, 529. Acetyl-aw-diethylcaproic acid, TRANS., 36. Acetyl-aω-diethylcaproic oxime, ω-, Trans., 37. Acetyldithionaphthol, 1306. Acetylditolyldiamidoethane, dichlor-, Acetylene, condensation of, under the influence of the silent discharge, 961. diiodide, isomeric varieties of, 594, Acetylenedicarboxylates, action ofphenylhydrazine on, 156. Acetylenedicarboxylic acid, synthesis of aconitic acid from, 237. Acetylenemercury, 119. oxychloride, 119. Acetylethylorthophenylenediamine, 612. Acetylhydrastine, 649. Acetylindole, [1'], 988. Acetyllactic acid, 128. Acetyllevulinic acid and its derivatives,

Acetyl-a-naphthyl ethyl ether, 964. - methyl ether, 964. Acetyl-\$\beta\$-naphthyl ethyl ether, 964. methyl ether, 964. Acetylnaphthylamidoacetic acid, 901. Acetylnitroethylalcohol, 858. Acetylorthamidoethylphenylhydrazine, 613.Acetylorthamidophenyl phenylcarbamate, 761. Acetylorthamidophenylmethylhydrazine, 613. Acetylparadesylphenol, Trans., 968. Acetylparamidobenzylphthalimidine, Acetylparamidothiophenol, 605. Acetylparamidotriphenylcarbinol, 1141. Acetylparamidotriphenylmethane, 1141. Acetylphenanthraquinol, Proc., 1890, 31. Acetylphenetoïl, 963. Acetylphenylamidoacetic acid, 623. Acetylphenyl-a-amidocoumarin, 623. Acetylphenyldichlorhydroxypyridone, Acetylphenylglycine, chlor-, 268. Acetylpseudocumylhydrazine, Trans., Acetylpyrroline, a-, and benzile, condensation products of, 1000. · molecular weight of, 906. Acetylquinol, thio-, 604. Acetyltoluidide, nitropara-, isomeric modifications of, 1112. Acetyltrichlorophenomalic acid, 365. Acetyltrimethylenecarboxylic Proc., 1890, 137. Acetylurethane, action of phenylhydrazine on, 889. Acetyl-values, Benedikt's, Proc., 1890, 72, 91. Acetylxylenylamidoxime, 50. Acid chlorides, formation of, by the action of sulphonic chloride, 1288. Acids, aliphatic, determination of the structure of, 1098. fatty, absorption of bromine by, 88. acetyl values of, Proc., 1890, 72, 91. - action of phosphoric anhydride on, Trans., 532, 980. - dissociation of the salts of, in solution, 684. - in soap, estimation of, 1475. --- influence of, on the evolution of gases by plants, 190. of complex function, electrical conductivity as a means of investi-

Acetylmalic acid, 363. Acetylmesoanthramine, 1426.

Acetylmetadiethoxybenzene, 964.

Acetyl-a-naphthenylamidoxime, 63.

Acetyl- $\beta$ -naphthenylamidoxime, 62.

of the acetic series, dispersion of,

gating the interaction of, 204.

1353.

Acids of the sugar group, 1398. reduction of, 597. - organic, affinity constants of, 1209. - - saving effect on albumin of, in vegetable foods, 538. unsaturated, 583. action of methyl diazoacetate on the ethereal salts of, 736. -formation of racemic acid by the oxidation of, 1274. Aconitic acid, synthesis of, from acetylenedicarboxylic acid, 237. Acritol, a., 468. Acrosazone, a-, 468. Acrylbenzoic acid, orthotrichlor-, 785. Acrylic acids, substituted, 27. — action of aromatic amines on, 371. Adenine, 534. --- brom-, 535. - estimation of, 534. Adipic acid, dibrom-, TRANS., 371. - dichlor-, Trans., 939. Adipomalic acid, 1239. Ægirine from Brazil, 344. Affinity coefficients, determination of, 4, 327, 1046. of alkyl halogen compounds and of amines, 1366. constants of organic acids, 1209. - of organic bases, determination of, 5. - residual, of inorganic salts, 444. Agrostemma githago, poison of the seeds of, 1458. Air, absorption of ammonia from, by vegetable soils, 821, 822. - atmospheric, analysis of, 412. — composition of, 1370. - electrical conductivity of, due to the formation of ozone, 676. estimation of moisture and carbonic anhydride in, 1188. - nitrous acid in, 406. Air-bath, new form of, 546. Alanine,  $\beta$ -, conversion of ethyl acrylate into, 862. Alanine, heats of combustion and formation of, 936. Albumin, composition of, 392. · decomposition of, by anaërobic ferments, 78. -decomposition of, by the bacillus of malignant ædema, 542. digestible, of fodders, action of hydrochloric acid and pepsin on, 651. - egg, action of resorcinol on, 804. - crystalline, 182. -molecular weight of, 1216. estimation of, in urine, 1199. free from ash, preparation and properties of, 272.

Albumin, heat of combustion of, 938. saving effect on, of organic acids in vegetable foods, 538. - serum, gases evolved in the putrefaction of, 78. -trichloracetic acid as a test for, Albuminoïds, action of hot water on, 535. - effect of "saccharin" on the digestion of, 1450. heat of combustion of, 938. precipitation of, from urine, 273. — various, nutritive value of, 394. Albumins, new reactions for, 1350. Albumose from Jequirity seeds, toxic action of, 398. Albumoses, reactions of, 804. Alcaptonuria and uroleucic acid, 188. Alcohol and benzene, products of the action of heated zinc-dust on a mixture of, 1429. and piperidine, products of the action of heated zinc-dust on, 1429. and pyrroline, products of the action of zinc-dust on, 1428. - and water, physical properties of 856. - commercial, detection of impurities in, 669. detection of impurities in, 1472. - influence of, on the action of invertase on cane-sugar, TRANS., 860. - new method of titrating, with chromic acid, 1030. – pentatomic, 729. - purification of, 727. supposed hydrates of, 857. tetrahydric, from limonene, 1313. Alcoholic liquids, examination and valuation of, 1194. Alcohols, action of hydrobromic and sulphuric acids on, 465. commercial, presence of furfuraldehyde in, 1400. - monohydric, dehydration of, 354. - of the fatty series, dispersive power of, 1034. secondary closed chain, 506. Aldehyde as the chief product of a fermentation, 1179. — in urine, 188. test for, 1197. Aldehydes, action of hydrogen sulphide on, 1092. · thio-, 25, 47**7, 47**8. Aldol, 861. Aldoximes, constitution of, 970. isomerism of, 1121. Alimentary canal, absorption of different fats by, 811. decomposition of ethereal

salts in, 1013.

Alkaline hydroxides, detection and estimation of, it presence of alkaline carbonates, 293.

Alkalis, estimation of, in presence of sulphites, 1468.

estimation of, in soils, 833.

— estimation of, in water, 299.

- influence of, on the action of invertase on cane-sugar, Trans., 852. Alkaloïds, estimation of, in coca leaves,

- ferrocyanides of, 1318.

- of the root of Stylophoron diphyllum, 649.

- reactions of, 310.

 utilisation and transformation of, during the germination of seeds, 543. Alkanna red, detection of, in wine,

Alkyl dicyanacetates, 1395.

haloïds and alkyloxides, affinity coefficients of, 4, 327.

- hydrogen oxalates, 235.

Alkyldiazoamides, mixed, nature of the combination between, Trans., 798.

- synthesis of, Trans., 785.

Alkylliydrastines and their derivatives, 1167.

Alkylisophthalic acids, symmetrical, 1283.

Alkylorthophenylenediamines and their derivatives, 611.

Alkyloxyquartenylic acids, ethereal salts of, 865.

Alkylpyrrolines, derivatives of, 65.

Allanite as a rock forming mineral, 460. Allocinnamic acid, 1417.

Alloy, crystalline, of copper, tin, and

lead, 335. Alloys, application of hydrogen peroxide in the analysis of, 419.

- behaviour of, near their freezing point, Trans., 387.

- eutectic, of tin, Trans., 386.

- of ferro-manganese and copper, electrical resistance of, 1356.

 of gold and platinum, liquation of, 947.

- ternary, 336.

Allyl imidophenylthiocarbamate, TRANS., 302.

, phenylimidophenylthiocarbamate, TRANS., 303.

tribromide, action of ammonia on,

trimethylammonium compounds,

Allylamine salts, brom-, 229.

Allylbenzene derivatives, conversion of, into propenylbenzene derivatives and their dispersion and refraction, 748. Allylbenzyl cyanide, 1142.

Allylcarbamides, intramolecular change of, into isomeric bases, 127.

Allyl-compounds, atomic re-arrangement in, 1084.

Allyldeoxybenzoïn, 1142,

Allyldiethylcarbinol, glycerol from.

Allyldimethylcarbinol, glycerol from, 121.

Allylethylsuccinic acids, isomeric, 133. Allylmethylpropylcarbinol, glycerol

from, 121.

Allylorthotolylthiocarbamide, 160. Allylphenylsemithiocarbazide, TRANS.,

Allylphthalimide, 890.

Allylpropylene-ψ-thiocarbamide, 861. Allylthiocarbamideallyl cyanide, 1104. Allylthiocarbamidebenzyl cyanide, 1104. Allylthiocarbamideethyl cyanide, 1104.

Allylthiocarbamidepropyl cyanide, 1104.

Allylthiouramidocinnamic acid, ortho-, 1123.

Allyltriphenylpyrroline, crystallography of, Trans., 748.

Alnus glutinosa, calcium oxalate in the leaves of, 191.

Aloin, acetyl-derivatives of, 639.

--- brom-, 639.

- from Barbados, Curação, and Natal aloes, 639.

preparation of, 170.

Alum, sodium, 1059.

Alumina, action of magnesium on, 693. - and ferric hydroxide, relative

basicity of, 1062. crystallisation of, in hydrogen chloride, 1071.

in phosphatic estimation of, manures, 420.

- estimation of, in soils, 833.

influence of, on the decomposition of potassium chlorate, Trans., 276.

- precipitation of, by ammonia, 420. Aluminite, new variety of, 454.

Aluminium, action of nitric acid on, 702.

— action of sulphuric acid on, 701.

— alkali silicates, 13.

- amalgam, 110.

- use of, in thermochemistry,

and iron, interference of chromium with the separation of, 84.

– antimonate, 216.

- chloride, anhydrous, preparation of, 13.

- preparation of, 108.

— diffusion of, in plants, 818.

- effect of, on the freezing point of tin, Trans., 385.

- Aluminium, estimation of minute quantities of, in iron and steel, 548.
- fluoride, electrolysis of, in igneous fusion, 1040.
- heat of neutralisation of,
- hydroxide, action of, on aluminium and ferric salts, 946.
- ---- potassium arsenate, 1378.
- ---- pyroarsenate, 1378.
- ---- sodium arsenate, 1378.
- steel, analysis of, 1471.
- ------ sulphate, analysis of, 85.

Amarantite, 454, 456.

Amber from Southern Mexico, 337.

Amethylcamphophenolsulphone and a nitro-colouring matter derived from it, 1153.

Amides, aromatic, reduction of, Trans., 957.

formation of alkyl-derivatives of, 491, 973.

— heat of formation of, 1359.

Amidic substances, effect of feeding on the secretion of, 278.

Amidines, formation of, 371.

Amido-acids, 621.

Amidoazo-compounds, 614.

Amido-compounds, formation of thiocyanates from, 749.

Amido-group, displacement of, by halogens, cyanogen, and thiocyanogen, 971.

— displacement of, by the sulphonic acid group, 1137.
Amidoximes, 253, 1265.

behaviour of, towards diazobenzene derivatives, 254.

--- cyanogen additive products of, 1120.

---- substituted, 43.

Amine hydrochlorides, dissociation of, in solution, 684.

- salts, absence of rotatory power in, 228.

Amine-ethylenediaminechloropurpureocobalt salts, 954.

Amines, action of nascent nitrous acid on, 38.

- aromatic, derivatives of, 1415.

- Amines, aromatic, thio-derivatives of,
- ---- tertiary, compounds of, with acetic acid and its homologues, 1156.
- Ammeline, properties and constitution of, 856.
- ---- synthesis of, 856, 1082.

Ammonia, absorption of, from the air by vegetable soils, 821, 822.

by vegetable soils, 821, 822.

action of, on the halogen compounds of arsenic, 1052.

albuminoïd, dynamical theory of,

- catalytic formation of, from nitrates, 689.

--- combination of sodium and potassium with, 209, 560, 679.

combination of, with boron chloride and silicon sesquichloride, 690.
 compounds of, with metallic per-

manganates, 947.
—— compounds of, with silicon brom-

ide and chloride, 559.

—— emission spectrum of, 97.

estimation of, in sand and sewage,

—— formation of, from free nitrogen, 1051.

- in burnt magnesium, 1209.
  - —— in the nutrition of plants, 287.
  - nitrification of, 282.
- Ruffle's method of estimating, 1024.

Ammonionickel thiosulphate, 13.

Ammonium amalgam, existence of, 1204.

--- borofluoride, 561.

— cadmium thiosulphates, 1057. — chloride, new form of, 694.

—— combination of alkali metals with, 450.

compounds, mixed quaternary, action of heat on the chlorides and hydroxides of, Trans., 767.

quaternary, isomerism in,

fluoroxyhypomolybdates, 703.
γ-hydroxycaproate, 880.

— hypochlorite, Proc., 1890, 22.

magnesium phosphate, estimation of nitrogen in, 291.

--- molybdoiodate, 107.

—— potassium thiosulphate, 564.

- pyroxyhexathiovanadate, 1381.

—— rhodium nitrite, 1382.

— salts, apparatus for the estimation of nitrogen in, 1341.

and, Proc., 1890, 22.

```
Ammonium salts, function of, in the nu-
  trition of higher plants, 79.
     sulphate and sodium nitrate, com-
  parative manurial value of, 287.
     sulphide precipitate, qualitative
  analysis of the, 84.
  — thiovanadate, 1381.
    - triiodate, 107.

    urate, thermochemistry of, 1041.

Amphibole of secondary origin, 1081.
Amyl alcohol in brandy from different
  parts of the German Empire, 1388.

    iodide, purification of, 116.

Amylamine, chloro-, 952.
    - dichloro-, 952.
  — tertiary, 1388.
Amylbenzoyldextroecgonine hydrochlor-
  ide, 913.
Amylcarbamide, 1388.
Amyleugenol, dispersion and molecular
  refractive energy of, 1202.
Amyl-α-naphthol, dispersion and mole-
  cular refraction of, 1201, 1202.
Amyl-β-naphthol, dispersion and mole-
  cular refraction of, 1201, 1202.
Amylohydrolyst, Trans., 531.
Amylthymol, dispersion and molecular
  refraction of, 1201, 1202.
Anæmia, pernicious, 400, 1017, 1177.
Analysis, colour, 1461.
Andesine from Bodenmais, 344.
Andropogon schenanthus, oil of, 951.
Angelic acid, derivatives of, 862.
Anhydride-formation in acids of the
   succinic series, 479, 741.
Anhydrite from North America, 218.
Anhydroanisylphenylthiouramidoxime,
   1265.
Anhydro-bases, preparation of, from
   amidomercaptans of the fatty series,
Anhydroberberilamide, TRANS., 1046.
Anhydroberberilanilide, Trans., 1047.
Anhydroberberilic acid, Trans., 994,
          - constitution of, TRANS., 998.
    ----- salts of, TRANS., 1037.
       ---- synthesis of, Trans., 1061.
    – chloride, Trans., 1042.
Anhydroglycolylphenylglycine, 245.
 Anilides, preparation of, 759.
      properties of, 758.
Anilidobenzoïcacid, metamidopara-, 374.
— metanitropara-, 374.
Anililidobutyric acid, α-, 1159.
 Anilidodinitrobenzyl methyl ketone, 773.
 Anilido-3-diphenyl-5-phenylpyrrol-
   idone, [1], Trans., 683.
 Anilidoethylenephenylamidoacetic acid,
 Anilidonaphthaquinone,
                             orthonitro-,
   1446.
```

Anilidopropionic acid, 1159. Anilidopropionylanilidopropionic acid Anilidopropylcarbamide, 977. Anilidopropylphthalimide, 976. Anilidopyrotartaric acid, pyridine- and pyrroline-derivatives from, 642.  $-\beta$ -, preparation of, 774. Anilidoquinonedianil, 912. Anilidotoluquinone, nitro-, 1446. Anilidotoluquinoneanil, 912. Anilidotrinitrotoluene, 486. Aniline, action of nascent nitrous acid on, 38. chlorination and bromination of, in presence of an excess of a mineral acid, 37. – citraconate, 368. —- conversion of, into benzenesulphonic acid, 1137. -- conversion of, into diphenyl, 972. — dibrom-, 165. ---- 1-2-3-dinitro-, 885. ---- 1-3-4-dinitro-, 886. ---- 1-3-6-dinitro-, 886. — isocinnamate, 1418. ---- salts, stability of, alone and in presence of water, 1361. thermochemistry of, 1361. sulphonation of, with potassium hydrogen sulphate, 1149. Anilinetrisulphonic acid, non-existence of, 1287. Anilpyrroylpyruvic acid, 1243. anhydride, 1243. Animal-cellulose, 227. Animal-economy, origin of urea in, 184. Animal-heat, 206. Animals, action of related compounds on, 280, 813, 1018. calorimetric investigation of heat production in, 182. effect of oil of mustard in foods on, 539. secretion of calcium carbonate by, 653. Anisaldehyde and succinic acid, condensation of, 770. reaction of albumin with, 1350. Anisaldoxime, orth-, 1410. Anisaldoximes, isomeric, 1122. Anisamide, 491, 975. reduction of, TRANS., 957. Anisamidine, 492. Anisamine, orth-, 1411. Anisenylamidoxime, 144. Anisenylbenzenylazoxime, 145. Anisenylcarbonylamidoxime, 145. Anisenylethenylazoxime, 145. Anisenylpropenylazoxime-w-carboxylic acid, 145

Anisidine, dinitro-, 752.

Anisidine, paranitroso-, 608. Anisilidenepyridylalkine, 1438. Anisimido-ethyl ether, 491. Anisodus luridus, constituents of, 658. Anisoil, chlorobenzenes obtained from, chloro-derivatives of, 240. - --- chloronitro-derivatives of, 240. —— ε-dinitro-, 752. ---- paranitro-, reduction of, 1120. — synthesis of ketones from, 963. Anisylacetamide, orth-, 1411. Anisylamidoxime, 1265. Anisylamidoximeethenyl, 1265. Anisylazoximepropenyl-ω-carboxylic acid, 1265. Anisylbromobutyrolactone, 771. Anisylbutyrolactone, 771. Anisylcarbamide, orth-, 1411. Anisylhydroxybutyric acid, salts of, Anisylimidoximecarbonyl, 1265. Anisylisocrotonic acid, 584, 770. Anisylmethylnitrosamine, paranitro-, Anisylnitrile, 1265. Anisylphenylcarbamide, orth-, 1411. Anisylphenyluramidoxime, 1265. Anisyluramidoxime, 1265. Anorthite, 19. - formation of, 1080. - from Miyakejima, Japan, 718. Anthochroite from Sweden, 114. Anthracene and its homologues, 511. - decahydride, 637. - formula of, Рвос., 1890, 102. ---- octohydride, 637. --- perhydride, 637. - reduction of, 1146. Anthracenedicarboxylic acid, [1:4], 512. Anthracene-1:2:-4-tricarboxylic acid, Anthracylpiperidine, tertiary, 1003. Anthraquinone and its homologues, 511. formation of, under certain conditions, 1425. Anthraquinonedicarboxylic acid, 1:4-, Anthraquinone-1 : 2 : 4-tricarboxylic acid, 512. Antimonates, 216. Antimoniuretted hydrogen. See Hydrogen antimonide. Antimony, detection and estimation of, double fluorides of, 216. - effect of, on the freezing point of tin, TRANS., 387. electrolytic estimation of, 294, 421. estimation of, 830. - evidence of the occurrence of a new element in, 434.

Antimony oxide, influence of, on the decomposition of potassium chlorate, Trans., 275, 277. pentachloride, vapour-density of, 16. – sulphate, Trans., 540. — sulphide, precipitated, composition of, 1217. Antipyrin, test for, 309. Antiseptic powers of isomeric organic substances, TRANS., 636. Apatite-group, synthesis of minerals of, Apiole, 35, 518. — constitution of, 1294. — molecular weight of, 725. Apione, constitution of, 1295. ---- diamido-, 1295. — dinitro-, 1295. Apioneacrylic acid, 36. Apionecrotonic acid, 36. Apioneketonic acid, 1294. Apionileglyoxylic acid, 1294. Apionol, 35. - constitution of, 1295. Aplysiæ, blood of the, 810. Aponic acid, 518. Apophyllite from the French Creek mines, 113. from the United States, 113. Aqueous vapour, specific volume of, 207.Arabinon, Trans., 59. Arabinose, heats of combustion and formation of, 1360. Arabinosecarboxylic acid phenylhydrazide, 154. Arabonic acid phenylhydrazine, 1398. Argol, analysis of, 303. Aricine, 803. Aromatic acids, unsaturated, preparation of, 891.

alkyl ketones and their oxidation, 979. - compounds, mercury nitrate as a

test for, 669. new method of chlorinating,

882. Aromatic-nucleus, constitution of, 238.

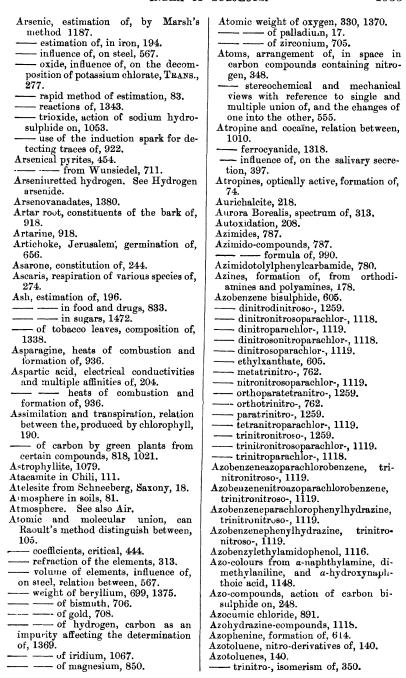
Aromite from Atacama, 455. Arrack, analyses of, 1195.

Arsenic, action of ammonia and hydrogen phosphide on the halogen compounds of, 1052.

- allotropic forms of, thermochemistry of, 679.

- chloride, combination of iridium phosphochlorides with, 1069.

—— detection and estimation of, 1193. —— estimation of, 923, 1026, 1193.



Azoximes, 253.

— and amidoximes, 41, 140, 141.

Azoxybenzene, metatrinitro-, 762.

— orthotrinitro-, 761.

Azoxyethylbenzylaniline, 1116.

Azoxy-β-naphthylamine, α-, 631.

Azoxyphenol ethers, 1119.

Azoxytoluenes, 140.

Azoxytoluenes, para-, isomerism of,

35Ó. В. Bacillus ethaceticus, 916. - fluorescens liquefaciens, chromogenic functions of, 655. putridus, chromogenic functions of, 655. — liquefaciens magnus, 78. ---- decomposition of gelatin by, 543. - of malignant cedema, action of, on carbohydrates, 1454. — decomposition of albumin by, 542. - Rauschbrand, 78. -- decomposition of gelatin by, - pyocyanicus, chromogenic functions of, 655. - -- colouring matters and aromatic products from, 189. ---- spinosus, 78. viscosus sacchari, 77. ---- vini, 77. Bacteria, cholera, reduction of nitrates by, 76. emphysema, 78. —— ferment action of, 916. Balance, gas, 823. Balsams, analysis of, 1032. Barium and strontium, separation of, 826, 924. - antimonate, 216. — benzylanthracenesulphonate, 1145. --- cadmium thiosulphates, 1058. —— carbonate, commercial, impurities in, 826. di-β-naphthylketoneoxidesulphonate, 510. ---- dinitro-β-naphthol, 1424. - estimation of, in foods, 195. --- hydroxide, decomposition of, by heat, 850. ---- oxide, action of magnesium on, 452. dimorphism of, 850. - oxides, influence of, on the decomposition of Trans., 280. potassium chlorate. - plumbate, 561.

rhodium nitrite, 1382.

Barium silicofluoride. solubility of, 925. – sulphate, analysis of, 1627. -deposits of, from mine water, 853. - -- from Perkins' Mill, Quebec, 572.--- toluenesulphonamate, [ortho-], 1137.- xylenesulphonamate, 1137. Barley, culture of excised embryos of, on nutrient solutions, Trans., 483. -- culture of excised embryos of, on water, Trans., 482. - estimation of starch in, 928. --- malted, distribution of diastase in, TRANS., 508. - structure of the grain of, Trans., 461. Barysite, a new lead silicate, 456. Baryta-raffinose, 580. Barytes, occurrence of, near Torda, 713. Bases, organic and inorganic, relative affinities of, 1367, 1368. determination of the affinity of, 5. volatile, equilibrium and reciprocal displacements between, 1362. Batatas edulis, carbohydrates of the, Bath, air-, new form of, 546. Batteries, measurement of the internal resistance of, 315. - secondary, theory of, 315, 1354. — storage, chemistry of, 842. — with fused electrolytes, 551. Battery, gas, new form of, 841. - secondary, theory of, 315, 1354. Beech, boric acid in, 656. - cupules of the, amount of mineral matter in and manurial value of, 287. Beef, influence of cooking on the digestion of, 1450. Beer, estimation of glycerol in, 426. Beeswax, detection of ceresin, ozokerite, and paraffin in, 421. Beet, sugar, in the experimental plots at Grignon in 1889, 820. Beetroot, manurial experiments with, the rôle of sugar and its development during the growth of the, 1020. Belladonine, 271. Benzalacetorie, metamido-, 1138. Benzaldehyde and ammonia, action of, on diacetyl, TRANS., 8. — and ethyl cyanacetate, condensa-tion product of, 1270. -- and pyrotartaric acid, condensation of, 775. - occurrence of benzamide in the urine after the administration of,

188.

Benzaldehyde, reaction of, with albumin, 1350.

Benzaldehydes, isomeric dichloro-, and the naphthols derived therefrom, 619. - thio-, α-, β-, and γ-, 25.

Benzaldoxime, 141.

-- a dimolecular isomeride of, 1122. Benzaldoximes, constitution of, 721.

isomeric, 1121.

Benzallevulinic acid, derivatives of, 375.

— — dibromide, 496. — — preparation of, 495. — acids, β- and δ-, 1129.

Benzamide in urine after administration of benzaldehyde, 188.

thermochemistry of, 1360.

Benzamidine, action of, on ethyl acetylmalonate, 496.

– benzamidylacetylmalonate, 496.

- metanitro-, 973.

Benzamido-orthobromothymol, Benzanilide, thermochemistry of, 1360.

Benzeïn-group, dyes of the, 157. Benzene, action of nitrous anhydride

on, 1401.

- action of selenic acid on, 50. - and alcohol, products of the action of heated zinc-dust on, 1429.

-- bromotriamidodinitro-, 982.

 chlorination of, 882. - condensation of, under the influ-

ence of the silent discharge, 961. - constitution of, 238, 602, 881, 1004, 1105, 1275, 1283, 1432, and

Proc., 1890, 101. - dichloro-, [para-], conversion of, into metadichlorobenzene, 882.

— 1-2-3-dinitriodo-, 886.

– 1-3-4-dinitriodo-, 887.

- 1-2-3-dinitrobromo-, 885.

 hexachloride, action of aniline on, 614.

 hexachlorides, molecular weights of, 725.

- hexachloro-, action of nitric acid on, 882.

metamerism in derivatives of,

- monobromo-, the "second," 881, 962.

- nitro-, action of chromium oxychloride on, TRANS., 253.

— detection of, 1194.

– pentabromonitro-, 983.

— pentamido-, 247.

- physical constants of halogen derivatives of, 2.

test for the hydroxy-derivatives of,

- tetrabromodinitro-, 982.

Benzene triamidodinitro-, 247.

– trianilidodinitro-, 248.

- tribromodinitro-, action of ethyl sodacetoacetate on, 772.

 action of ethyl sodiomalonate on, 377.

 tribromotrinitro-, action of ethyl sodiomalonate on, 497.

 trisubstituted derivatives of, 884. Benzeneazobenzylidene-naphthylamine,

Benzeneazodianilidonaphthalene, 629. Benzeneazodihydroxynaplithalene,

[1:2:2'], 628. Benzeneazo-a-dinaphthylamine, 912. Benzeneazo-aß-dinaphthylamine, 993. Benzeneazo- $\alpha\beta$ -dinaphthylamine,  $\alpha$ -, 385. Benzeneazo- $\beta\alpha$ -dinaphthylamine,  $\alpha$ -, 385. Benzeneazo- $\beta\beta$ -dinaphthylamine, 993. Benzeneazodiphenylcarbamide, 616. Benzeneazoethyl-x-naphthylamine, 911. Benzeneazo-\(\beta\)-naphthylamine, triazine from, Trans., 329.

Benzeneazo-β-naphthyltolylamine, 99. Benzeneazoparatolyl-α-naphthylamine,

Benzeneazophenol-a-naphthylamine, 912.

Benzene-derivatives, conversion pentamethylene-derivatives into, 129. Benzenediazonitrosophenyltolylamine, 610.

Benzenes, bromonitro-compounds prepared from, 983.

chloro-, obtained from anisoil, 365.

Benzene-series, alteration of compounds of, on exposure to air and light, 1401.

- selenium and oxygen derivatives in the, 34.

Benzenesulphoncyanamide, 501.

 ${f Benzene sulphone or tham idobenzamide}$ and its anhydride, 1289.

Benzenetribenzoic acid, 770. Benzenylacetoethenylazoxime, 44.

- paranitro-, 46.

Benzenylamidoxime, action of acetaldehyde and ethyl acetoacetate on, 44.

 action of aldehydes on 253. - action of ethyl chloracetate on, **260**.

— paramido-, 46. – paranitro-, 44.

Benzenylamidoximeglycollic acid, 260. - anhydride, 260.

Benzenylamidoximeoxalic acid, 259. Benzenylanilidoxime, reactions of, 43. Benzenylazoximeisoamenyl, 254.

Benzenylazoximeisobutenyl, 254. Benzenylazoximemetanitrobenzenyl,

metanitro, 256.

```
Benzenylazoximemethenylcarboxylic
   acid, 258.
 Benzenylazoximephenylethenyl, 253.
 Benzenylazoximepropenyl, 254.
 Benzenylazoximesalicenyl, 254.
 Benzenylcarbonylimidoxime, paranitro-,
 Benzenylethenylazoxime, paranitro-,
 Benzenylhydrazoximeamidobenzenyl-
   amine, 255.
Benzenylhydrazoximeamidometanitro-
   benzylidene, metanitro-, 256.
 Benzenylhydrazoximeisoamylidene, 254.
 Benzenylhydrazoximeisobutylidene, 254.
 Benzenylhydrazoximephenylethylidene,
 Benzenylhydrazoximepropylidene, 254.
 Benzenylhydrazoximesalicidene, 254.
 Benzenylorthotoluidoxime, 256.
 Benzenylparatoluidoxime, 43.
Benzenylparatoluylcarbonylimidoxime,
Benzhydroxamic acid, constitution of,
Benzidine, 1297.
   — metadiamido-, 782.
— metadinitro-, 782.
— metamido-, 783.
— metanitro-, 783.
Benzidinediurethane, 1298.
Benzidinemetadisulphonic acid, 58.
Benzidinesemiurethane, 1298.
Benzidinesulphone, 59.
Benzidinesulphonedisulphonic acid, 60.
Benzidinesulphonesulphonic acid, 59.
Benzidinesulphonic acid, 57.
Benzidinetetrasulphonic acid, 59.
Benzidinetrisulphonic acid, 58.
Benzile, action of ammonium formate
  on, 784.
  — chloro-, 783.
  --- condensation products of a-acetyl-
  pyrroline with, 1000.
  — nitro-, 624.
  — — dioximes of, 624.

    oximes, atomic arrangement in,

  349.
  constitution of, 721.
 — reduction of, Proc., 1890, 31.
Benzilemetanitrophenylhydrazine, 151.
Benzilemethylphenylhydrazone, 24.
Benzilemethylphenylosazone, 24.
Benzileorthocarboxylic acid, 989.
Benzileparacarboxylic acid, 168.
Benzimido-ethyl ether, metanitro-, 973.
Benzobutyl alcohol, 309.
         - oxime, Trans., 310.
Benzoic acid, action of nitrous anhydride
  on, 1401.

    detection of, in foods, 1031.
```

Benzoic chloride, action of, on sodium cyanamide, 1253. - sulphinide, action of acids on, 94. Benzoin, action of ammonium formate — and acetone, compound from Trans., 783. Benzoïnoxime, a second, 1264. Benzoparatoluidine, 43. - thio-, 43. Benzophenodihydroketometadiazine, Benzophenone, derivatives of, 1422. - paramido-, 1142. Benzophenones, halogen, oximes of, Benzophenyldihydroketometadiazine, derivatives of, 178. Benzorthotoluidide, thio-, 256. Benzoylacetonemethylphenylhydrazone, Benzoylacetonitrile, 1251. Benzoyl  $\beta$ -acetylmetanitrophenylhydrazine, a-, 150. Benzoylamidocinnamic acid, 623. Benzoylamido-orthocoumaric acid, 623. Benzoylanisenylamidoxime, 145. Benzoylanisoïl, para-, 963. Benzoylbenzamide, paranitro-, 486. Benzoylbromallylamine, 953. Benzoylbromothymol, 366. Benzoylbutaldehyde, 358. Benzoylchlorodibromophenol, 1108. Benzoyl-compounds of carbohydrates, glucosamine, and glucosides, 578. Benzoylcotarnine, 528. Benzoylcotarnineoxime, 528. Benzoylcyanamide, 1253. Benzoyldihydropyrroline, 65.
—— derivatives of, 1430. Benzoyldithionaphthol, 1306. Benzoyleugenol, dibromo-, 638. Benzoylformaldehyde, preparation of, Benzoylimidocinnamic acid, Plochl's, Benzoylimidocoumarin, Plochl's, its isomerides, 621. Benzoyl-a-isoamylpropionic acid, Benzoylmethylecgonine hydrochloride, Benzoyl-\(\beta\)-naphthenylamidoxime, 62. Benzoyl-a-naphthyl ethyl ether, 964. Benzoyl-\(\beta\)-naphthylhydrazine, 61. Benzoylparaxylidine, 606. Benzoylphenetoïl, para-, 964. Benzoylphenylacetaldehyde, 359. Benzoylpicolylfurylalkeine, 1437. Benzoylpropaldehyde, 358. Benzoylpropionic acid, 895. Benzoylpyridyl-\(\beta\)-lactic acid, 521.

Benzoylsalicenylamidoxime, 143. Benzoyltannin, 163. Benzoylthio- $\beta$ -dinaphthylamine, 1306. Benzyl alcohol, orthamido-, 1254. - derivatives of, 178. - paranitro-, 486. - bisulphide, orthonitro-, 488. - cyanide, displacement of methylene hydrogen atoms in, 1142. imidophenylthiocarbamate, Trans., methyl ketone, bromodinitro-, 773. - trinitro-, 1419. phenylimidophenylthiocarbamate, Trans., 298. - sodium thiosulphate, 1419. — sulphide, orthonitro-, 487. — Δ<sup>2</sup>-<sup>cistrans</sup> tetrahydroterephthalate, - thiocarbamate, preparation, reactions and properties of, TRANS., 293. Benzylacetamide, orthamido-, 1442. - paranitro-, 486. Benzylacetanilide, orthamido-, 1443. Benzylacetone, metamido-, 1138. Benzylacetoparatoluidide, orthamido-, Benzylalsorbite, 730. Benzylamine. action of, on methylene chloride, 887. · paranitro-, 486. Benzylamineparacarboxylic acid, 977. Benzylangelicalactone, 376. Benzylaniline, orthamido-, 1258. orthonitro-, reduction of, 1444. - paranitroso-, 614. Benzylanthracene, 1145. · dihydride, 1426. Benzylanthracenesulphonic acid, barium salt of, 1145. Benzylanthranol, 1425. Benzylbenzamide, orthamido-, 1442. orthonitro, 1442. Benzylbenzoylanilide, orthamido-, 1258. Benzylcarbamide, paranitro-, 486. Benzylcyanophenylthiocarbamide, amido-, 1408. Benzyldeoxybenzoïn, ortho- and paranitro-, 1142. · paramido-, 1143. Benzyldihydroanthranol, 1425. Benzyldihydropyrroline, 65, 1430. Benzyleneanthrone, amido-, 1425. Benzylethanetricarboxylic acid, 896. Benzylethylmetamidophenol hydrochloride, orthonitro-, 1116. orthamido-, 1116. Benzylformamide, orthonitro-, 1443. Benzylformanilide, orthonitro-, 72. Benzylformorthotoluide, orthonitro-, 74. Benzylformoparatoluidide, orthonitro-,

Benzylfurfuraldoxime, 1267. Benzylfurfuryl, 1407. Benzyl- $\gamma$ -hydroxyvaleric acid,  $\beta$ -, 377. Benzylideneamidophenyltolylamine,610. - paranitro-, 610. Benzylidenebenzidine, metanitro-, 1298. Benzylidenechloroparatolylsulphone, Benzylidenechlorophenylsulphone, 379. Benzylidenediethylsulphone, 56. Benzylidenelepidineparasulphonic acid, 1435.Benzylidenemetanitrophenylhydrazine, 150. Benzylideneorthamidoazotoluene, 616. Benzylideneorthonitrophenylhydrazine, Benzylideneparamidodiphenylamine, 609. Benzylideneparaxylidene, 606. Benzylidenepseudocumylhydrazine, Trans., 55. Benzylidenequinoline - 3 - carboxylic acid, 1325. Benzylidenetetrahydro - \beta - naphthylamine, ac.-, 632. Benzylidenexylidine, metanitro-, 606. Benzylisoanisaldoxime, 1261. Benzylisobenzaldoxime, 1123. and phenyl cyanate, interaction of, paranitro-, modifications of, 1412. Benzyllevulinic acid, 376. – ---- bromo-, 376. Benzylmetanitroisobenzaldoxime, 1262. Benzylmethylcarboxyglutaric acid, 1135. Benzylmethylsuccinic acid, 1134. anhydride, 774. Benzyloxanthranol, 1144, 1425. Benzylparamidodiphenylamine, 609. Benzylparatoluidine, orthamido-, 1258. Benzylparaxylidine, 606. Benzylphenylsulphone, 380. Benzylphosphines and their derivatives, Benzylphosphinic acid, 766. Benzylphosphinous acid, 766. Benzylphthalimidine, paramido-, 487. Benzylpyridyl chloride, action of moist silver oxide on, 794. - platinochloride, 794. Benzylsuccinic acid, 774, 895, 1135. homologues of, 774. – anhydride, 896. Benzylthiosulphuric acid, 1419. Benzylvalerolactone, 376. Berberal, Trans., 1062. action of alkalis on, Trans., 1075. action of phenylhydrazine on, TRANS., 1077. - constitution of, Trans., 1002. examination of, Trans., 1000.

Berberal, hydrolysis of, TRANS., 1064. Blood, arterial and venous, the differ-- synthesis of, Trans., 1079. Berberilic acid, TRANS., 994, 1048. - action of heat on, TRANS., 1051. Berberine, 1011, TRANS., 992.
—— constitution of, TRANS., 1003. ----- hydrobromide, tetrabromo-, 1012. hydrogen sulphite, Trans., 1096.
 oxidation of, with potassium permanganate, Trans., 1010. Berberis alkaloïds, 648. Berberoline, constitution of, Trans., Berilic acid, Trans., 1091. ---- salts of, TRANS., 1092. Berthollet's laws, 1367. Beryllium antimonate, 216. atomic weight of, 698, 1375. - fluoride, heat of neutralisation of, - oxide, action of magnesium on, preparation and properties of, 697. —— phosphates, 1056. —— sodium silicates, 562. Betaines of pyridine bases, 1431. - preparation of, 747. Betel leaves, ethereal oil of, 135. Bidioxymethyleneindigo, 1140. Bile, urobilin in the, 187. Bile-pigments, 181. Bilirubin, molecular weight of, 76. oxidation of, 181. Biliverdin, reduction of, 181. Birch oil, 256. Bismuth, atomic weight of, 706. - behaviour of, with sulphur and selenium, 216. - effect of, on the freezing point of tin, Trans., 384. — electrolytic estimation of, 295. --- electrolytic separation of, from copper, 1029. - phosphorescence of, in the sulphides of the alkaline earth metals, 201. --- physical properties of, 707. — potassium iodides, 708, 1067. - separation of, from lead, 421. - sulphide, precipitated, composition Bis-1-phenyl-3-methyl-4-methylene-5pyrazolone, TRANS., 222. Blacking, boot-, analysis of, 1478. Bleaching powder, gas-volumetric estimation of, 1469. Blende containing manganese, estimation of zinc in, 827.

--- carbonic oxide, detection of, 1200. —— destruction of glucose by, 1172. - estimation of iron in, 297. ---- heat developed by the action of oxygen on the, 274. - influence of salts on the clotting of, 1176. - method of raising the specific gravity of, 393. - of the Aplysiæ, 810. - oxidation in the, 651. permeability of the red corpuscles of, in relation to their isotonic coefficients, 809. - proportion of, to body weight, 1015. stains, detection of, 840. — sugar in the, 276. Blood-corpuscles, red, lecithin and cholesterin in, 1017. Blood-fibrin, heat of combustion of, Blood-plasma of the splenic vein, is free hæmoglobin present in?, 1016. Blue, Egyptian, 215. - fluorescent, 157. --- non-fluorescent, 156. Body-weight, proportion of blood to, 1015. Boiler scale, composition of, 944. Boiling points, law of, 1043. - of substances are a function of their chemical nature, 941, 1364. Bootblacking, analysis of, 1478. Boracite, artificial production of, in the wet way, 1384. Boric acid, behaviour of mannitol towards, 1357. — in the beech, 656. - and phosphoric acids, a derivative of, 108. - anhydride, action of magnesium on, 693. Borneol, action of carbon bisulphide on, — preparation of, from terpene, Trans., 963. specific volume of, 169. Borneols, a-, camphorates of, 790. Bornite, mineral related to, from Montana, 710. Bornyl phenylcarbamates, 518. Bornylxanthic acid, 517. Boron chloride, combination of ammonia and hydrogen phosphide with, 690. - fluoride, combination of, with hydrogen phosphide, 448. — hydrides of, 693. influence of, on steel, 566.

ence between in different blood vessels,

Boron, occurrence of, in plants, and its physiological meaning, 1338. preparation of, 331. Botryogen, 456. Bouquet of fermented liquids, 1180. of wines, influence of yeast on, Bournonite from Arizona, 572. Brandy, analyses of, 1195. - from different parts of the German Empire, amyl alcohol in, 1388. Braunite from Örebrö, 1076. Brazileïn, tribromo-, 997. Brazileïndihydroxime, 997. Brazileïnphenylhydrazone, 997. Brazilin, 996. - tetramethyl ether, bromine derivatives of, 997. Bromides, iodides, and chlorides of the alkalis, distinction between, 289. Bromine, volumetric estimation of, in the presence of chlorine and iodine, Bromo-derivatives of the paraffins, formation of, from alcohols, 465. Bromoformberberine, 1012. Brucine, bromination of, 1330. – dichloro-, 1330. ferrocyanide, 1318. Brucite from the Tyrol, 339. Burners, new, 106. Butaldehyde and succinic acid, condensation of, 588. Butaldehydes, condensation of phenylenediamines with, 138. Butter, analysis of, 838. estimation of soluble and insoluble fatty acids in, 93. examination of, 305. — volatile fatty acids of, 186. Butyl  $\beta$ -ethoxyquartenylate, 866. —  $\beta$ -isobutoxyquartenylate, 866. - mercaptan, tertiary, Trans., 639. —  $\beta$ -methoxyquartenylate, 866. - nitrites, normal and secondary, 353. - β-propoxyquartenylate, 866. Butylbenzenesulphonic acid, para-tertiary, 1296. Butylcarbinol, tertiary, 1388. Butylphenol, para-tertiary, 1296. Butylsuccinic acid, 872. Butyric acid, γ-amido-, 360. - detection and estimation of, in wines, in the presence of acetic acid, 1344. - acids, electrolysis of, 1237. Butyrolactonedicarboxylic acid, βу-, Butyronitrile, y-bromo-, 360. ---- γ-chloro-, 1221.

C. Cacoclasite not a distinct species, 457. Cadmium, action of, on the halogen salts of cadmium, 1376. — antimonate, 216. -- apatites, chlor-, and brom-, 11. — arsenate, 563. arsenates, 11. - arsenoapatite, chlor- and brom-, 11. — double thiosulphates of, 1057. - effect of, on the freezing point of tin, TRANS., 383. - electrolytic estimation of, 294. electrolytic separation of, from aluminium, chromium, iron, nickel, and zinc, 1028. electrolytic separation of, from arsenic, molybdenum, and tungsten, electrolytic separation of, from cobalt and nickel, 664. — oxide, action of magnesium on, 452. - phosphates, 11. potassium arsenate, 563. - salts, electrical conductivity of solutions of, 1203. — separation of copper from, 295. — sodium arsenate, 563. - - thiosulphates, 12. ----- sub-hydroxide, 1376. ---- sub-oxide, 1376. ---- thiosulphate, 12, 564. Cadmous hydroxide, 1376. - oxide, 1376. Cæsium carbonate, reduction of, by magnesium, 333. Cakes, feeding, relative values 395. Calamine, estimation of zinc in, 418. from the United States, 113. Calciothorite, 1079. Calcium carbonate, secretion of, by animals, 653. solubility of, in fresh and sea water, 450. - effect of, on the freezing point of tin, Trans., 384. estimation of, in presence of phosphoric acid, iron, aluminium, and manganese, 417. - hydrogen phosphate, presence of magnesium in, 664. oxalate, formation of, in plants,

- oxide, action of magnesium on,

phosphide, preparation of, 942.

— influence of, on the decomposition of potassium chlorate, Trans.,

191.

Calcium plumbate, 561. tetrahydrogen phosphate, 695. Callose, a new fundamental substance in vegetable membrane, 734. Calomel, action of hydrocyanic acid on, Calorimeter, mixing, new form of, 440. Calycanthine, 403. Calycanthus glaucus, analysis of the seed of, 403. Camphamines, 516. Camphene, constitution of, Trans., 964.
——glycol, 1313. Camphonitrophenol, acetyl and ethyl derivatives of, 63. - benzoate, 64. — phosphate, 63. — phthalate, 64. Camphor, a new monobromo-, TRANS., action of ethyl oxalate on, Trans., 652. — an isomeride of, 169. compounds of, with phenols, 1427.
 constitution of, Trans., 832, 964. - distillation of, with zinc chloride, 1248. — isobromo-, Trans., 828. new bases derived from, 516.  $\beta$ -nitro- and  $\alpha$ -chloronitro-, constitution of, 515. — oil of, 261. --- phenolsulphonic acids from, 791. production of, from turpentine, TRANS., 961. — rotatory power of, when dissolved in various oils, 1427. specific volume of, 169. Camphoraldehyde, constitution of, 359. Camphorates of the  $\alpha$ -borneols, 790. Camphoric acid, constitution of, 517. - acids, 790, 995. Camphoroxalic acid, TRANS., 653. - reduction of, TRANS., 654. Camphorsulphonic acid, bromo-, TRANS., Camphoryl chloride, chloro-, 995. Camphoryldiamide, 1151. Camphorylimide, 1152. Cantharidin, derivatives of, 640. phenylhydrazone, 640. Capillarity, influence of, on the solvent action of liquids, 555. Capillary tubes, rise of solutions in, 684. Capric chloride, 1252. Caprolactone, action of sodium ethoxide on, 868. Caprylic chloride, 1252. Caraway, oil of, Norwegian, 902. Carbamide chlorides, aromatic. 633. condensation of, with ethyl aceto-

acetate, 1240.

Carbamide, conversion of thiocarbamide into, 1399. estimation of, 308. - heats of formation and combustion of, 206. See also Urea. Carbanilamidocresol, 248. Carbanilamidocumenol, 249. Carbanilamidonaphthol, 248. Carbanilamido-α-naphthol, 249. Carbanilamidophenanthrol, 249. Carbanildiamidoresorcinol, 249. Carbanilidoacetophenoneoxime, 251. Carbanilidoacetoxime, 251. Carbanilidoamidoazobenzene, 616. Carbanilidoamidoazotoluene, 616. Carbanilidoanisaldoxime, 251. Carbanilidobenzaldoxime, 251. Carbanilidobenzeneazo-\(\beta\)-naphthylamine, 616. Carbanilido-a-benzilmonoxime, 252. Carbanilido-γ-benzilmonoxime, 252. Carbanilidobenzophenoneoxime, 251. Carbanilidocamphoroxime, 251. Carbanilidocarvoxime, 251. Carbanilidofurfuraldoxime, 251. Carbanilidohydroxyazobenzene, 614. Carbanilidohydroxyhydrazobenzene, Carbanilidoisoanisaldoxime, 1261. Carbanilidoisobenzaldoxime, 253. Carbanilidoisocuminaldoxime, 1263. Carbanilidoisonitrosobutyl methyl ketone, 252. Carbanilidometanitrobenzaldoxime, Carbanilidometanitroisobenzaldoxime, Carbanilidomethylpropylglyoxime, 252. Carbanilido-a-naphthaquinoneoxime, Carbanilido-β-naphthaquinone-α-oxime, Carbanilido- $\beta$ -naphthaquinone- $\beta$ -oxime, Carbanilido-orthanisaldoxime, 1411. Carbanilidophenoldisazobenzene, 615. Carbanilidoquinoneoxime, 252.

Carbanilidothymoquinoneoxime, 252. Carbazoledisulphonic acid, 1297.

Carbizines, constitution of, 1440.

densation products of, 246. Carbodiphenyline, 167.

Carbohydrates, 1085.

œdema on, 1454.

Carbodiamidoresorcinol, thio-, 249. Carbodiimides and orthodiamines, con-

Carbohydrate from Stachys tuberifera,

- action of the bacillus of malignant

colloïd, method of separation of,

- Carbohydrates, colloid, precipitation of, by salts, 122.
- in peach gum, 1022.
  in the seeds of Phaseolus vulgaris,
- of the sweet potato, 1022.
- soluble, in the seeds of legumes, 917.
- sugar vielding, insoluble, in seeds, 544.
- Carbolic acid, commercial, examination of, 300.
- Carbon, action of fluorine on different forms of, 557.
- and soda or potash, use of, in analysis, 1027.
- and sulphur, simultaneous estimation of, 2900.
- as an impurity affecting the estimation of the atomic weight of hydrogen, 1369.
- assimilation of, by green plants,
- bisulphide, explosion of, with air or oxygen, TRANS., 625.
- - heats of combustion and formation of, 1361.
- estimation of, in graphite, 923.
- estimation of, in organic substances in the wet way, 1467.
- fluorides, hydrates of, 1386.
- preparation of, 558.
- free and combined, estimation of, in iron and steel, 1027.
- graphitic, different forms of, and their derivatives, 448.
- tetrafluoride, 944, 1053.
  volumetric estimation of, in iron,
- Carbon-acids, bibasic, new synthesis of,
- Carbon-atoms, limitation of the free rotation of singly bound, 723.
- Carbon-chains, closed, synthesis of substances containing, 877.
- Carbon compounds, action of ammoniacal cupric oxide on, 21.
- - arrangement in space of the atoms in the molecule of, containing nitrogen, 348.
- - chemical constitution of, and the sign and variations of their rotatory power, 722.
- dispersion of, 1353.
   oxidation of the sulphur in, 1462.
- Carbonates, hydrogen, electrolysis of, 1204.
- rate of solution of, in acids, 843. — volumetric estimation of, 417.
- Carbonic anhydride, density of, 322.
- estimation of, 1188.

- Carbonic anhydride, estimation of, in air, 1188.
- — estimation of, in potable waters containing magnesium, 197.
- estimation of, in salts, 417.
- — formed in manured and unmanured soils, 408.
- improvement in the method of estimating by volume, 194.
- influence of muscular work, hunger, and temperature on the exhalation of, 1334.
- - influence of, on the products of fermentation, 281.
- - reduction of, by magnesium,
- oxide, action of, on nickel, TRANS.,
- condensation of, under the influence of the silent discharge, 691,
  - detector, 194.
- effect of the silent discharge on, 1358.
- reduction of, by magnesium, 1373.
- solubility of, in mixtures of alcohol and water, 103.
- Carbonic-oxide-hæmoglobin, detection of, 432, 1200.
- Carbonyldiparanitrobenzenylamidoxime, 45.
- Carbonylhydroferrocyanic acid and its derivatives, 116.
- Carbonylorthamidophenol, changes of, in the animal system, 1413. constitution of, 1413.
- Carbonylorthohydroxyamidophenol,
- Carboxybenzylphthalamic acid, para-,
- Carboxycinnamic acid, ortho-, oxidation of, 54.
- Carboxycinnamyldithiocarbamic acid, ortho-, 1123.
- Carboxyl-group in the aromatic series, influence of certain groups on the thermochemical value of, 439.
- Carminic acid, constitution of the hydrocarbon obtained from, 1145.
- Carrotene, 641.
- in Diaptomus, 640.
  - in leaves, 285.
- Carvacrol, bromamido-, constitution of,
- bromonitroso-, constitution of, 884 Caseïn, estimation of, 312.
- estimation of, in condensed milk, 92.
- heat of combustion of, 938. Cassia, oil of, examination of, 423.

Castor-oil bean, poisonous principle of,

- examination of, 429. Catechol, action of chlorine on, 754,

 physiological action of, 1019. - preparation of, TRANS., 587.

Cattle marrow, 1172.

Celestine from Mineral Co., West Virginia, 1071.

occurrence of, near Torda, 713. Celestine-bed of Koppand, mean composition of, 713.

Cell, vegetable, behaviour of, with alkaline silver solution, 401.

Cell. See Voltaic.

Cell-membrane, vegetable, composition of, 1456.

Cell-membranes, vegetable, 283. Cellulose, acetylation of, Trans., 1.

- and its modifications, 581.

---- animal, 227.

--- constitution of, TRANS., 4.

estimation of, 303.

--- existance of an enzyme in the seeds of grasses which dissolves, TRANS., 497.

- flax, characters of, TRANS., 199.

- from various sources, 1457.

---- pentacetate, Trans., 2.

Celtis reticulosa, scatole in the wood of,

Cephalanthin, 171.

Cerebrose, identity of, with galactose, 121, Trans., 57.

Ceresin, detection of, in beeswax, 421. Cerium earths, 851.

---- hydrogen sulphate, 452.

- phosphate, from South Norway,

111. Cerotic acid, oxidation of, by nitric acid, 1237,

Cervl alcohol from flax, TRANS., 198.

Cetraric acid, 600.

Chalcedony, expansion of, 1372.

Champignons du muguet, alcoholic fermentation and conversion of alcohol into aldehyde by, 1179.

Charcoal, oxidising and decolorising properties of, 690.

Chavicol, properties and derivatives of,

Chelidonine, reactions of, 310.

Chemical change, rate of, 327.

— under great pressure, evidence of, afforded by petrographical research, TRANS,, 404.

energy, increase of, at the free surface of liquids, 328.

equilibrium between hydrogen chloride and hydrogen in conjunction with metals, 685.

Chemical equilibrium, rôle of solid substances in, 1365.

reactions, the dead space in, 1207. Chinine, formation of lepidine deriva-

tives from, 1433. Chitin, heat of combustion of, 938.

Chloral, action of sulphides on, 291. and succinic acid, condensation of,

Chloral-ammonia, action of heat on,

Chloralide, action of phosphoric chloride on, 27.

Chloralimide, 230.

and its isomeride, 1093.

Chloranilic acid, decomposition products of, 130.

Chloranil, action of sodium thiosulphate on, 1419.

Chloric acid, action of light on, TRANS.,

Chlorides, bromides, and iodides of the alkalis, distinction between, 289.

· hydrochlorides of, 106.

Chlorine, action of water in the light on, TRANS., 613.

- and hydrogen chloride, estimation of, when mixed, 412.

 and crystalline sodium carbonate, direct production of, from sodium chloride, 10.

- direct estimation of, in mixtures of chlorides and iodides, 920.

estimation of, in water, 86.

- free, detection of, in hydrochloric acid, 289, 547.

- gas, preparation of, for laboratory purposes, 445.

- importance of, in the plant, 1182. - oxygen and hydrogen, equilibrium between, 8.

preparation of, in a Kipp's apparatus, 6.

- rapid detection and estimation of, in alkaline thiocyanates, 663.

Chlorine-water, rate of decomposition of, by light, 849.

Chloroform, action of sulphides on, 291. Chloroformamide-synthesis, a modification of, 974.

Chloroformberberine, 1012.

Chlorophyll, colouring matters of, 171.

estimation of, in leaves and in extracts, 672.

relation between the assimilation and transpiration produced by, 190. green colouring

Chlorophyll-grains, matter of, 641. Cholesterin, higher homologue of, 757.

in plants, 1457.

- in red blood corpuscles, 1017.

molecular weight of, 914.

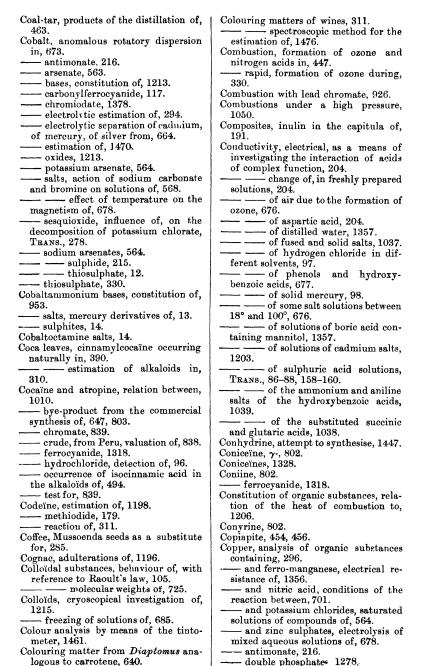
Cholesterin propionate, 932. - reaction of, 932. Cholesterol, occurrence of, in Scopolia carniolica, 403. Cholestol reaction, 1474. Cholic acid, molecular weight of, 914. Chondrin, heat of combustion of, 938. Chondrus crispus, iodine in, 402. Chromates, double, 1065. Chrome iron, 568. ---- ore, analysis of, 828, 1027. - --- volumetric estimation of chromium in, 298. Chromic bromide, isomeric forms of, 1063. Chromiodates, 1378. Chromite, artificial preparation of, 568. Chromium bases, constitution of, 1213. - electrolytic estimations with, 294. — estimation of, in foods, 195. --- estimation of, in iron and steel, - oxide, influence of, on the decomposition of potassium chlorate, TRANS., 277, — potassium arsenate, 1378. — pyroarsenate, 1378. --- sodium arsenate, 1378. — sulphide, 215.
— volumetric estimation of, in chrome iron ore, 298. Chrysanthemum cinerariæfolium, homologue of, cholesterin from, 757. Chrysene, 1312. — amido-, 789, 902, 1313. — synthesis of, 515. Chrysenic acid, 1312. Chrysoketone, 1312. Chrysoquinone, preparation of, 1312. Chrystobalite, 1071. Chyle, destruction of glucose by, 1172. - human, 394. - presence in, of a ferment which destroys sugar, 810. - sugar in the, 276. Cinchine, formation of lepidine derivatives from, 1433. Cinchomeronamic acid, 1157. Cinchomerondianilide, 1158. Cinchomeronimide, 1157. Cinchomeronphenylphenylimide, 1158. Cinchona alkaloïds, estimation of, 309. Cinchonic acid, sulpho-, 1435. Cinchonidine ferrocyanide, 1318. melting point of, 1166. Cinchonine ferrocyanide, 1318. Cincole, constitution of, 1315. Cineolic acid, constitution of, 1315. anhydride, 1314. Cinnamaldehyde, action of ethyl acetoacetate on, 768. and ammonia, action of, on diacetyl, and on phenanthraquinone, TRANS., 11.

VOL. LYIII.

- paranitro-, derivatives of, 161. Cinnamaldoxime, paranitro-, 161. Cinnamenylacrylic acid, oxidation of, 1274.Cinnamenylcinchonic acid, a-, 176. Cinnamenyldimethylglyoxaline, TRANS., Cinnamenyldiphenyleneoxazole, TRANS., Cinnamenyl-a-naphthacinchonic acid. a-, 1007. Cinnamenyl-\beta-naphthacinchonic acid. α-, 1008. Cinnamenyl a-naphthaquinoline, α·. Cinnamenyl-β-naphthaquinoline, a•, Cinnamic acid, amido-, derivatives of, - and its homologues, preparation of, 891. — benzoyllactimide of, 624.
— preparation of, 892. - and isocinnamic acids, nature of the isomerism of, 495. Cinnamolmetatoluylenediamine, 139. Cinnamon oil, examination of, 423. Cinnamylcocaïne from coca leaves, 76. - occurring naturally in, 390. Cinnamylidenetolidine, 1299. Cinnamylindole, [3'], 989. Citraconanil, 1102. and pyranilpyroïnlactone, identity of, 774. Citraconic acid, action of aniline on, 368. - - synthesis of, from ethyl propenyltricarboxylate, 1101. Citrates, distillation products of, 1102. Citrazinimide, consitution of, 736. Citric acid, estimation of, in lemon juice, - thermochemistry of, 101. Citronella oil, 231. Citronellic aldehyde, 231. Citronellyl alcohol, 231. Citrus, crystalline substances from the fruits of various species of, TRANS., Clark cell, standard, 202. Clark's soap test, standard solution for, Clays, composition of, 1060. Clotting, influence of salts on, 1176, Clover, red, yields and composition of a variety of, 1183. Congulation of blood, &c., influence of salts on, 1176. Coal, occurrence and estimation of sulphur in, 414. Coal-tar, coumarone in, 496. 5 l

Cinnamaldehyde, orthonitro-, action of,

on malonic acid, 163.



Copper carbonylferrocyanide, 117.

— chloride solutions, thermal behaviour of, 1206.

---- chromiodate, 1379.

effect of, on the freezing point of tin, Trans., 379.

---- electrolytic estimation of, 294.

electrolytic separation of, from arsenic, 1029.

—— electrolytic separation of, from cadmium, 665.

— electrolytic separation of, from iron, aluminium, cadmium, chromium, cobalt, nickel, iron or zinc, 1028.

--- estimation of, 665.

- - estimation of, by titration with potassium cyanide, 547.

estimation of, in iron and steel,

evidence of the occurrence of a

new element in, 434.

hydrosulphide, Proc., 1890, 50.

influence of, on steel, 567.
lead and tin, alloy of, 335.

--- native, pseudomorphs of, after

azurite, 453.

— nitrate, crystallised basic, 1376.

— ores, tourmaline-bearing, from Chili, 114.

oxide, behaviour of, at high temperatures, Trans., 269.

position of potassium chlorate, Trans., 279.

oxides, reduction of, by magnesium, 333.

— oxychlorides, 1058.
— oxysulphides, 1211.

---- precipitate formed in ordinary water, 851.

precipitation of, as thiocyanate, in assaying, 547.

— potassium carbonate solution, estimation of sugars with, 1031.

— pure, production of, in a crystalline condition, Proc., 1890, 95.

salts, action of, on metallic cyanides, 464.

--- separation of, from cadmium, 295. --- sulphate, tetrabasic, 851.

— volumetric estimation of, 665, 926. Copper. See also Cuprous.

Copper-bismuth-glance, artificial, 337. Coquimbite, 454.

Corn cockle seeds, poison of, 1458.

Corpuscles, red, lecithin and cholesterin in, 1017.

permeability of, in relation to their isotonic coefficients, 809.

Corundum in Patrick Co., Virginia, 570.

---- synthesis of, 112.

Cossaite from the Upper Susa Valley, 344

Cotarnelactone, 529.

Cotarnelactonic acid, 529.

Cotarnic acid, 529.

olive oil, 930.

Cotarnine, constitution of, 530. —— oxime, 528.

Cotarnmethine methochloride, 528.

Cotarnonenitrile, 528. Cotton-seed oil, detection of, in fats and

307.

----- testing lard for, 428.

estimation of, in lard,

— thermochemistry of, 939. Coumaric acid, a-benzoyllactimide of,

Coumarinpropionic acid, 584, 777.

Coumarins, thio-, and their behaviour towards hydroxylamine and phenyl-hydrazine, 624.

Coumarone, bromo-, 496.

---- chloro-, 496.

—— dibromide, 496. —— dichloride, 496.

---- in coal-tar, 496.

Cow, relative value of various foods for the, 395.

Cranberry juice, fermentation and composition of, 1455.

Crataegus oxyacantha, calcium oxalate in leaves of, 191.

Cresol, crude, examination of, 425. Cresolbenzeïn, ortho-, 897.

Cresolglycollic acid, ortho-, 375.

Cresols, condensation of dichlorether with, 1140.

physiological action of the three, 813.

Cresyl orthosulphide, 1420.

Cresylethylsulphine, ortho-, 1420. Cresylsulphone, ortho-, 1420.

Critical atomic coefficients, 444.

points, molecular constitution of compounds at their, 443.

Crotonic acid, molecular weight of, 737.

---- acids, thio-derivatives of, 361.

Crotylpyridine, 1436.

Cryohydrates, nature of, Trans., 361. Cryoscopic investigation of colloïds,

1215.
—— method of determining molecular weights, 324.

Crystallisation, apparatus for, at low

temperature and in absence of moisture and air, 1043. Crystallography of dibenzoylcinnamenederivatives, TRANS., 714. Crystals, fluid, 106. Cuminildioximes, isomeric, 1143. Cuminolmetatoluylenediamine, 139. Cumylidenebenzidine, 1298. Cumylidenetolidine, 1299. Cupric. See Copper. Cuprous chloride, influence of hydrogen chloride on the solubility of, 109. Cupules of the beech, amount of mineral matter and manurial value of, 287. Cyanacetone, the so-called, 1094, 1095. Cyanalkines, 1158. Cyanumide, constitution of the derivatives of, 1222. Cyanamines, a new class of dyes, 1307. Cyanethine, formation of, 1158, 1159. Cyanides, metallic action of cupric salts on, 464 Cyanobenzyl chloride, ortho-, 1249. — — para-, 239. — — para-, derivatives of, 977. ---- cyanide, ortho-, action of hydroxylamine on, 146. --- para-, 239. --- mercaptan, ortho-, 1250. ----- phthalimide, para-, 977. — thiocyanate, ortho-, 1249. Cyanodiphenylsuccinic acid, 504. Cyanogen disulphydrate, 29. iodide, vapour density and melting point of, 949. - monosulphydrate, 351. Cyanomethine, formation of, 1158, 1159. Cyanoparatoluamide,  $\omega$ -, 239. Cyanoparatoluic acid, ω-, 240. Cyanophenylacetamide, para-, 239. Cyanophenylacetic acid, para-, 239. Cyanophenylethenylamidoxime, para-, Cyanophenylethenylazoximebenzenyl, Cyanopropine, formation of, 1159. Cyanopropylphthalimide, γ-, 360. Cyanuric acid, synthesis of, 1082. Cymene, action of chromyl chloride on, 978, 1254. - chloro-, action of sulphonic chloride on, 1288. — dibromo-, 366. - dinitramido- and dinitro-, constitution of, 753. Cymenesulphonamide, nitro-a-, 1287. Cymenesulphonic acid, amido-a-, 1287. chloro-, 779.
— chloro- and bromo-a, 1288.
— chloronitro-, 780. — mitro-α-, 1287.

Cymyl methyl ketone, ortho-, 770.

Cystin in the urine, 1018. Cystinuria, 189.

### D.

Dahllite from Norway, 714. Damascenine, 1317. Daturic acid, 1396. Dead space in chemical reactions, 1207. Decahydroquinoline and its derivatives, Decahydroquinolyl dithiocarbamate, Decamethylenedicarboxylic acid, 1237. Decvlene, 594. Deliydroerythrol, 730. Dehydrobenzyloxanthranol, 1144. bromide, 1144. --- bromo-, 1145. Dehydrodiacetyllevulinic acid, action of ammonia on, 864. - --- preparation of, 864. Dehydrofichtelite, 385. Dejections, influence of the pancreatic juice on the colour of, 397. Delvauxite, from Vysočany, Bohemia, Densities, gas, new method of determining, 321. of sulphuric acid solutions, TRANS., 69-85, 139-158. Deoxybenzoïn, derivatives of, 1143. displacement of the methylene hydrogen atoms in, 1142. Deoxybenzoïnorthimidodicarboxylic acid, 1143. Deoxybenzoïnorthodicarboxylic acid, - anhydride, 11**43**. Deoxybenzoïnparacarboxylic acid, dibromo-, 168 Deoxyfuroïn, 1245. Desaurines, molecular weight of, 1144. Descloizite from American localities, Desmine from the French Creek Mines, Desmotropy in phenols, 1404. Desylacetophenone, TRANS., 643. action of phenylhydrazine on, TRANS., 647. - oximes of, TRANS., 650. Desylamine, 890. Desylanisoil, para-, TRANS., 969. Desylphenol, para-, Trans., 965. - fusion of, with potash. TRANS., 971. reduction of, with hydriodic. acid, TRANS., 971. Desylph halamic acid, 890.

Desylphthalimide, 890.

Development of frog's spawn, influence of inorganic salts on, 393. Dextroatropine, 75. Dextrococaine, 647, 913. Dextroecgonine, 646, 913. Dextrinase, 998. Dextrins, benzoyl derivatives of, 578. Dextrose, action of ethyl acetoacetate on, in presence of alcoholic ammonia, 732. benzoyl compounds of, 578. --- copper solution for the estimation of, 198. - formation of volatile fatty acids from, 731. - synthesis of, 466. Dextrosecarboxylic acid phenylhydrazide, 154. Dextrotropic acid, 74. Diabetes, phloridzin, 1336, 1337. Diabetic coma and acetonuria, 399. Diacetamide, 1239. Diacetamido-orthobromacetylthymol, para-, 602. Diacetamidophenylhydrazine, 151. Diacetyl, action of benzaldehyde and ammonia on, TRANS., 8. action of cinnamaldehyde and ammonia on, TRANS., 11. action of salicylaldehyde ammonia on, TRANS., 10. - symmetrical tetrabromo-, 359. - tetrachloro-, action of ammonia and ethylenediamine on, 475. - —— derivatives of, 232. ---- trichloramido-, 233. Diacetylbrazileïn, dibromo-, 997. Diacetylbromotoluylenediamine, 975. Diacetylbutane, ωω<sub>1</sub>-, Thans., 241. Diacetylchloranilic acid, 1271. Diacetylcyanhydrin, tetrachloro-, 233. Diacetyldiamidophenylamine, 1115. Diacetyldiamines, 1115. Diacetyldicyanhydrin, tetrachloro-, 233. Diacetyl-aw-diethylpentane, TRANS., 29, 32. Diacetyl-aw-diethylpentanedioxime, aw-, TRANS., 33. Diacetyldinitramidodiphenylamine, Diacetyldiparatolyldiamidomethyleneorthophenylenediamine, 246. Diacetyldiphenodioxazine, 491. Diacetyldiphenylpropylamine, 1423. Diacetylglyoxylic acid, tetrachloro-, 132. Diacetylhydrolapachone, 1310. Diacetylhydroisolapachone, 1310. Diacetylmesoanthramine, 1426. Diacetylmetaxylidine, 1315. Diacetylorthodiamidotoluene, 1115. Diacetylorthophenylenediamine, 1115. Diacetyloxalenediamidoxime, 123.

Diacetylparadesylphenol, Trans., 968. Diacetylpentane, αω-, action of dehydrating agents on, TRANS., 13. - action of reducing agents on, Proc., 1889, 145. --- condensation products of, TRANS., 26. Diacetylphenamidophenol, 159. Diacetylphenylimidophenol, 490. Diacetylquinol, monothio-, 604. Diacetylsalicenylamidoxime, 143. Diacetylsuccinenediamidoxime, 125. Diadochite from Vysočany, Bohemia, 715. Dialdehydes, action of methylhydrazine Dialkyl cyanothiocarbamides, 1103. Diallyl, derivatives of, 351. first oxide of a tetrahydric alcohol from, 354. — hexasulphide, 577. ---- oxysulphide, 577. — tetrabromides, 20, 223. Diallylcarbinol, first oxide of the pentahydric alcohol from, 353. - pentatomic alcohol and unsaturated glycerol from, 729. Diallylthiocarbamide, 477. Diamidophenazine, [2:2'], 1114. Diamine-compounds, metallic, 953. Diamines, aromatic meta-, fluorescent derivatives of, 138. - ortho- and polyamines, formation of azines from, 178. action of carbonyl chloride on, 975. action of quinone on, 1445. — oxidation products of, 1444. Diamond from Russel Co., Kentucky, 337. - nature of the, 1210. Diamylamine, chloro, 952. Diamyloxamide, 1388. Diamylresorcinol, dispersion and mole-cular refraction of, 1201, 1202. Dianilidomethylbromacetoacetic Dianilidomethyldichloracetic acid, 643. Dianilidonaphthalene, [2:2'], 629. para-, 911. Dianilidonaphthaquinone, 911. Dianilido-orthodiazothiole, 526. Dianilidoparaxyloquinone, 606. Dianisylbromopentalactone, 772. Dianisylhydroxyvaleric acid, 772. Dianisylpentalactone, 772. Dianisylpentolic acid, 584, 771. Dianisylpentylenic acid, 771. Dianisyltetrylene, 584, 772. Diauthryl, dichloro-, and its octochloride, 638. --- hexabromo-, 638. - octobromide, dibromo-, 638. ---- tetrahydride, 638.

Diaptomus, colouring matter analogous to carrotene from, 640.

Diastase, characters of, 519.

considered as a mixture of maltase and dextrinase, 998.

- distribution of in malted barley, TRANS., 508.

- does the aleurone-layer secrete?, TRANS., 520.

genesis and distribution of the two varieties of, in the resting and germinating seed, Trans., 505.

- localisation of the secretion of, in the embryo, TRANS., 493.

— of secretion, Trans., 509.

- action of, on ungelatinised starch, Trans., 510.

- of translocation, TRANS., 509. Diazine derivatives, para-, 268, 525. Diazines, meta-, 1158. Diazoamides, normal and mixed, TRANS.,

Diazoamido-compounds, nitrated, 39. Diazoamidonitrobenzene, 39.

Diazoimidonitrotoluene, 39.

Diazobenzene, 1115.

-chloride, action of sodium thio-sulphate on, 1419.

Diazobenzeneorthotolubenzylamine, 969. Diazobenzeneparatolubenzylamine, 969. Diazo-compounds, action of finely divided copper on, 970.

Diazodibromobenzene sulphate, 165.

Diazometanitrobenzene-methylparatoluidide, combination of, with diazoparabromobenzene - methylparatoluidide, Trans., 793.

Diazo - β - naphthalene - methylparatoluidide, combination of, with diazoparabromobenzene - methylparatoluidide, TRANS., 797.

Diazoparabromobenzene - methylpara toluidide, combination of diazometanitrobenzene - methylparatoluidide with, Trans., 793.

combination of diazo-β-naphthalene-methylparatoluidide with, TRANS., 797.

Diazo-reactions, 971.

Diazoresorcinol, 156.

Diazoresorufin, 156.

Diazo-salt-group, and a phenyl-residue, intramolecular transformation between, 1116.

Diazosulphonic acids, improvement in Sandmeyer's reaction with, 1149.

Diazotoluene, ortho-, action of sodium sulphide on, 1420.

- para-, action of sodium sulphide on, 1420.

Dazouracil, 1241.

Diazouracilearboxylic acid, 1240.

Dibenzallevulinic acid, 1129. Fibenzamide, 1289.

Dibenzenylazoxime, paranitro-, 45.

Dibenzyldiazoximeoxalene, 259. Dibenzoylacetonitrile, 1251.

Dibenzoylamidoethylpiperonylcarboxylic acid, Trans., 1059.

Dibenzoylbromotoluylenediamine, 976. Dibenzoylcarbamide, asymmetrical, 1253.

Dibenzoylcinnamene, aß-, TRANS., 662. - action of bromine on, TRANS., 711.

- action of heat on, Trans., 677. action of hydroxylamine on,

TRANS., 710. action of phenylhydrazine on,

TRANS., 708. crystallography of TRANS., 715.

- distillation of, TRANS., 685.

nitro-, Trans., 676.preparation of, Trans., 672.

Dibenzoylcinnamenimide, TRANS., 692. —— crystallography of, TRANS., 718.

- dibromide, Trans., 693.

Dibenzoylethane, 1269.

Dibenzoylmethylhydrazine, 23.

Dibenzoyl- $\alpha\beta$ -naphthylenediamine, 370. Dibenzoylorthophenylenediamine, 370.

Dibenzoylorthotoluylenediamine, 370.

Dibenzoylpentane, aw-, action of de-hydrating agents on, Trans., 27. Dibenzoylsalicenylamidoxime, 143.

Dibenzoyltrimethylenephenyldiamine, 1244.

Dibenzylacetic acid, 1135.

Dibenzylalsorbite, 731. Dibenzylcarbamide, paranitro-, 487.

Dibenzyl-derivatives, formation of, 504. Dibenzylidenediphenyline, 166.

Dibenzylmalonic acid, 1134. Dibenzylorthodicarboxylic acid, 1143.

Dibenzylphosphine, 767.

· Hoffman's, identity of, with tribenzylphosphine oxide, 492. Dibenzylphosphinic acid, 767.

Dibenzylthiocarbamide, paranitro-, 487. Dibromhydrin, a., constitution of, 1083.

Dibutylbenzene, tertiary, 1297.

Dibutyloctohydrophenanthroline, 138.

Dibutyric acid, γ-thio-, 1221.

Dibutyronitrile, γ-thio-, 1221. Dicalcium phosphate, 1056.

Dicarbanilido-a-benzildioxime, 252.

Dicarbanilido-β-benzildioxime, 253.

Dicarbanilido-y-benzildioxime, 253.

Dicarbanilidohydrazobenzene, 614.

Dicarbanilidosalicylaldoxime, 251. Dicinnamylorthodiamidotoluene, 1115.

Dickinsonite from Branchville, 1072. Dicoumarin, 584.

Dicresol, diamido-, action of nascent

nitrous acid on, 38.

Difurfuraldiphenyline, 166.

- of rice-straw, 546.

Difurfurodiacetylene, dibromo-, 960.

Digestibility of boiled milk, 650.

Dicyanobenzene, meta-, properties of, Dicyanobenzenylamidoxime, 1120. Dicyanobenzyl disulphide, ortho-, 1251. Dicyanodibenzylamine, ortho-, 1251. Dicyano-β-naphthenylamidoxime, 1121. Didehydrotrichlorodihydroxypiperazine, Di-diphenyltriazole, 271. Diet, effect of, on the secretion of amidic substances, 278. Diethoxydichloroquinols,  $\alpha$ - and  $\beta$ -, 137. Diethoxydichloroquinone, para-, 136. Diethoxydiphenyldiketopiperazine, 1161. Diethoxydiphenylpiperazine, nitrosopara-, 1332. Diethoxyphenyldiketopiperazine, para-, Diethyl  $\beta$ -dichloromuconate, Trans., Diethylacetamide, 473. Diethylacetanilide, 473. Diethylacetic anhydride, 473. chloride, 473. Diethylacetonitrile, 474. Diethylallylthiocarbamide, 1241. Diethylamylcarbamide, 1241. Diethylaniline, thio-, 611. Diethylbenzidinephthalic acid, 1298. Diethylbenzoylethylmethane, 493. Diethylbenzylthiocarbamide hydrochloride, 1241. Diethyldimethylenetrisulphone, 1093. Diethylenediamine, 476. Diethylethylamine,  $\beta$ -, 474. Diethylethylenepseudothiocarbamide, Diethylglutaric acid, 878. Diethylguanidine, 1241. Diethylmethyluracil, 31. Diethyloxetone, 869. Diethyloxetonecarboxylic acid, 869. Diethylphosphorous acid, Trans., 634. Diethylpropylthiocarbamide picrate, Diethylpyrroline,  $\lceil 1 \rceil$ , 908. Diethylsuccinic acids, symmetrical, 740, - asymmetrical, 743. Diethylsulphonediethylmethane, 56.

Dihomobenzenylazoime, ortho-, 256. para-, 48. Dihydroapiole, 1294. Dihydrodiphenylenehydroxyanthraquinone, 515. Dihydrophthalic acid, 1278. dibromide, 1278. - dihydrobromide, 1278. Dihydropyrroline, 65. derivatives of, 1430. Dihydroquinazoline, 1443. Dihydroquinazolines, 1443. Dihydroterephthalic acid  $\Delta^{1:2}$ ,  $113\overline{1}$ . Dihydroxybenzylidenediphenyline, ortho-, 166. Dihydroxydihydroquinoline, Diethylsulphonediiodomethane, 56. Dihydroxydimethylheptamethylene, Diethylsulphonedimethylmethane, 56. ortho-, Proc., 1889, 145. Diethylsulphonemethane, 56. Diethylsulphonethiophenylmethane, 57. Diethylsulphonethylmethylmethane, 56. Diethylthiocarbamide, derivatives of, Dihydroxydiphenylamine, 369. Diethyltrimethylenepseudothiocarb-Dihydroxydithiobenzoic acid, 163. amide, 1242. Diffusion, influence of, on the solvent action of liquids, 555. - cadmium chloride, 559. Diformyldiamidophenazine, 800. — zinc chloride, 558.

 of the proteïds of various grasses, 657. Digestion, artificial and natural, 536. - of agricultural feeding stuffs, 1451. - of proteïds, 275. in the pig, 183. -of abuminoïds, effect of "saccharin" on, 1450. - of beef and fish, influence of cooking on, 1450. Digitalin, 171. crystallised, 65. Digitogenin, 996. Digitonin, composition of, 996. Dihexolactone, 868. Dihexonic acid, 869. Dihexyl ketone, Trans., 533.

hydrazone of, Trans., 535. - oxime of, Trans., 535. Dihexylcarbinol, TRANS., 536. Dihydrodiphenyldihydroxyantetrazine, Dihydroparadinitroazobenzene, 1116. dibromide, Dihydroxyamidonaphthalene, 2':2:1-, Dihydroxybenzoylphosphinic acid, 619. chloro-, Dihydroxydimethylglutaric acid, 1099 Dihydroxydimethyltriphenylmethane, Dihydroxydinaphthylphenylmethane, Dihydroxyethylbenzene, metapara-, 55. Dihydroxylamine barium chloride, 559.

ene, 1148.

Dihydroxymaleic acid, the so-called, 958. Dihydroxynaphthalene, Trans., 633. Dihydroxynaphthalene, [2:2'], 627. Dihydroxynaphthalene, 1:1':2:2'dichloro-, 629. Dihydroxynaphthalene, 1:3:3':1':2:2'tetrachloro-, 629. Dihydroxyparaquinones, para-, action of hydroxylamine hydrochloride on, 493. Dihydroxyphenazine, 801. Dihydroxyphosphinic acids, 618. Dihydroxypyromellitic acid, pyrazolone derivative of, 984. Dihydroxyquinoline, [1:4], 523. Dihydroxyquinone, chloropara-, 242. - action of aniline on, 756. --- diethyl ether, 967. ---- iodochloro-, **242**. Dihydroxythymoquinone, constitution of, 884 Dihydroxytoluquinone, Zincke's, constitution of, 756. Diisoamylbenzene, dispersion and molecular refraction of, 1201, 1202. Diisobutyl dichloroglycollate, 236. Diisopropenyl, 728. Diketohexane, hexachlor-a-, 964. Diketohydronaphthalene, decachloro-[2':2], 629. tetrachloro-, and its decomposition products, 784. Diketohydroxyhexene, pentabromo-, 1109. Diketones, action of methylhydrazine on, 24. - new class of, 388. Diketones, a-, action of aldehydes and ammonia, on, TRANS., 8. - α-, reduction of, Proc., 1890, 31. Diketopentamethylene derivatives, action of amines on, 1090. Diketopentamethylenehydroxycarboxylic acid, chloro-, 131. - --- dichloro-, 132. Dilaurylcarbinol, Teans., 983. Dilaurylcarbinyl acetate, Teans., 984. Dimethoxydichloroquinols,  $\alpha$ - and  $\beta$ -, Dimethoxydichloroquinone, para-, 136. Dimethoxydiphenylpiperazine, action of nitrous acid on, 1332. Dimethoxyphenylglyoxylic acid, 967. Dimethoxyterephthalic acid, 986. Dimethyl berberilate, TRANS., 1050. - dichloroglycollate, 236. — diethyl oxalate, 236. — dipropyl glycol, Proc., 1890, 138. — methylaspartate, 870. Dimethyl-w-acetylcaproic acid, Рвос., 1890, 117. Dimethylacetylene and its tetra bromides,

1220.

Dimethylamidohexylene, 1001. Dimethylamidohydroxyquinone, 757. Dimethylaniline, action of aluminium chloride on, 137. thio-, 610. Dimethylanilinesulphonic acid, 610. Dimethylanthracene, dibromo-1: 3-, Dimethylanthracylene, meta-, 511. Dimethylanthranol, [1:3], 511. Dimethylanthraquinone, [1:4], 512. Dimethylapionole, 35. Dimethylasparagine, 870. Dimethylbenzoic acid, 3:5-dinitro-2:4-, - 3-nitro-2 : 4-, 980. Dimethyl-aa'-diacetylpentane, aα'-, Proc., 1890, 116. Dimethyldiethylammonium chloride and hydroxide, action of heat on, Trans., 780. Dimethyldihydroxybenzophenone, 899. Dimethyldimethylenetrisulphone, 1093. Dimethyldiphenylaldine, 373. Dimethyldiphenyldiamidomethyleneorthophenylenediamine, 246. Dimethyldiphenylthiocarbazide, 1260. Dimethylenediparatoluidine, 888. Limethylethylenediamine, 954. Dimethyl-2-ethylquinoline-1-orthocarboxylic acid, [3 : 3'], 1327. Dimethylglutaric acid, 878. Dimethylglutaric acid, aa-, 1099. Dimethylglutaric acid, symmetrical, Dimethylglutaric acids, isomeric symmetrical, 132. - anhydride, aa-, 1099. - dibromo-αα-, 1099. Dimethylheptamethylene, formation of, Proc., 1889, 145 Dimethylindene, metamido-βγ-, 1138. Dimethylindigo, 383. Dimethylisopropenylcarbinol, 727. action of acids on, 728. Dimethylketol, 1234. Dimethylmandelic acid, orthopara, 979. Dimethyloxetone, 868. Dimethyloxetonecarboxylic acid, 868. Dimethylparamidophenyl ethylxanthate, Dimethylphenylglyoxylic acid, 5-nitro-2:4-,980.Dimethylpimelic acid, aa'-, Proc., 1890, Dimethylpyridinecarboxylic acid, 795. Dimethylpyridinedicarboxylic acid, 1002.

Dimethyladipic acid, symmetrical, 132.

Dimethylamidobenzene - a - azonaphthal-

Dimethylamidodiphenylamine, dinitro-,

```
Dimethylpyrrolidine, 1000.
    - nitroso-, 1001.
                               molecular
Dimethylpyrroline,
                       αβ-,
  weight of, 906.
Dimethylquinol, dichloro-, 1247.
Dimethylquinoline, amido-, 1004.
Dimethylquinoline-a-aldehyde,
                                  ortho-
  para-, 1158.
Dimethylquinoxaline, tetrachloro-, 232.
Dimethylsuccinamic acid, a-dichloro-
  symmetrical, 958.
Dimethylsuccinic acid, asymmetrical,

 α-dichloro-, substitution pro-

  ducts of, 957.
    - acids, symmetrical, relation of, to
  pyrocinchonic acid, 743.
    - - the two symmetrical, 743.

    anhydride, α-dichloro-symmetrical,

  957.

    action of phenylhydr-

  azine on, 1327.
Dimethylstrychnine, 1448.
Dimethyltartaramide, tetrachloro-, 233.
Dimethyltartarimide, tetrachloro-, 233.
Dimethyltaurine, $\beta$-, 128.
Dimethyltaurocarbamic acid, 128.
Dimethylterephthalic acid, [2:5], 982. Dimethylterephthalic acid, [2:6], 981.
Dimethyltetramethylenediamine,
Dimethyltetraphenylethane, asymmetri-
  cal, 959.
Dimethylthiocarbamide, 477.
Dimethyluracil, 31.
Dimethylvalerolactone, 590.
Dinaphthyl bisulphide, diamido-, 994.
   – sulphide, αβ-, 1312.
  — sulphides, 1311.
 Dinaphthylamine, \alpha\beta-, behaviour of, when
  combining with diazobenzene, 385.
Dinaphthylcarbamide chloride, $\beta$-, 633,
  634, 993, 1311.
Di-a-naphthyldiamido-orthodiazothiole,
  --- cyanide, 527.
Di-B-naphthyldiamido-orthodiazothiole,
  527.

    cyanide, 527.

Di-a-naphthyldiketodihydroparadiazine,
Dinaphthyl-ay-diketopiperazine,
Dinaphthyl-aγ-diketopiperazine,
  1309.
Di-B-napthylketone oxide, 510.
         - bromo-, 510.
         - dinitro-, 510.
Dinaphthylmethane, 511.
Dinaphthylpiperazine, β-, 1333.
```

Dinaphthylsulphone, aa-, 1312.

Dinaphthylsulphone, αβ-, 1312. Dinaphthylsulphone, etaeta-, 1311. Dioxalparatoluidide, 525. Dioxanilide, 525. Dioxyberberine, Trans., 1003, 1087. - action of alkalis on, TRANS., 1089. - constitution of, TRANS., 1008. Dioxymethylenephenylglyoxylic Dipalmitylcarbinyl acetate, Trans., 987. Diphenacylparatoluidine, 525. Diphenamidophenylene, 158. Diphenic anhydride, molecular weight of, 715. Diphenyl, action of nitrous anhydride on, 1401. conversion of aniline into, 972. — derivatives of, 782, 897. - diamidopara-, action of nascent nitrous acid on, 38. —  $\Delta^{1:3}$  dihydroterephthalate, 1132. — Δ<sup>2:5 cistrans</sup> dihydroterephthalate, 1131. dithiodimethyl ether, 605. - orthoparadicyanide, 167. Diphenylacetylenediureïne and its derivatives, 1290. Diphenylaldine, 373. Diphenylamine, acti-anhydride on, 1401. action of nitrous - dinitramido, 1114. — orthamido-, 1113. — orthonitro∙, 1113. --- paramido-, 609. – triamido-, 1114. Diphenylamineparacarboxylic acid, metanitro-, 374. Diphenyl-\beta-benzoylpropionic acid, a-, Trans., 681. - action of heat on, TRANS., action of hydroxylamine on, TRANS., 683. — action of phenylhydrazine on, TRANS., 682. — ethylamide of, Trans., 706. — methylamide of, Trans., 703. — reduction of, Trans., 681. Diphenylbromotoluquinoxaline, 976. Diphenylbutane, 1408. Diphenylbutylene, 1408. Diphenylcarbamide, metamido-, 760. metanitro- and paranitro-, 760. Diphenylcarboxyanilide, para-, 759. Diphenyldiamido-orthodiazothiole, 526. Diphenyldibutine ketone, paradinitro-, Diphenyldichlorodiketoparadiazine, 526. Diphenyl-αγ-diethyl-βδ-diketopiperazines, 1160. Diphenyldiketodihydroparadiazine, 268. Diphenyldiketoparadiazine, 526.

Diphenylpropyloxamide, 1422.

Diphenyl-αγ-diketopiperazine, 1332. Diphenyl-αδ-diketopiperazine, 1333. Diphenyl-aγ-diketopiperazine-βδ-homocarboxylic acid, 1162. Diphenyl- $a\gamma$ -dimethyl- $\beta\delta$ -diketopiperazines, isomerism of, 1160. Diphenyldimethylpyrazoloneacetic acid, Diphenyldisazonaphtharesorcinol, 261. Diphenylene ketone oxide, tribromo-, Diphenylenebisazodimethylaniline, 167. Diphenylenebisazo- $\beta$ -naphthol, 167. Diphenylenebisazoresorcinol, 167. Diphenylenemetaphenylenediamine, amido-, 614. Diphenylethylamine,  $\beta$ -, 1407. Di-phenylethyltriazole, 271. Diphenylfurfuran, TRANS., 944, 953.
——reduction of, TRANS., 955. · tetrabromo-, Trans., 954. Diphenylfurfurancarboxylic acid, Trans., 951. action of bromine on, TRANS., Diphenylfurfurandicarboxylic acid, Trans., 951. Diphenylglutaric acid, 132. - symmetrical, 384. Diphenylhomofluorindine, 1444. Diphenylhydrazine, derivatives of, 1259. Diphenylhydroxykyanidine, 497. Diphenylimidophenylene, 490. Diphenyline, derivatives of, 166. Diphenylizinedihydroxytartaric acid, metanitro-, 151. Diphenylketopiperazine, 1160. Diphenylmetadiazine, amido-, formation of, 1159. Diphenylmetaphenylenediamine, paranitroso-, 613. Diphenylmethane, derivatives of, 1422. Diphenyl-aβ-naphthatriazine, TRANS., Diphenylnaphthylamine, 1410. Diphenylnaphthylamine-blue, constitution of, 1308. Diphenyl-\(\beta\)-naphthylcarbamide, 633. Diphenylnitrosoketopiperazine, 1161. Diphenylorthoparadicarboxylic acid, Diphenylparanaphthalenediamine, 911. Diphenyl-5-phenylpyrrolidone, Trans., 683, 696. Diphenylphosphoryl chloride, 34. thiochloride, 35. - trichloride, 35. Diphenylphthaloylic acid, 897.

Diphenylpiperazine, 1332.

Diphenylpropyl alcohol, 1423.

Diphenylpropylamine, 1422. Diphenylpropylcarbamide, 1422. Diphenylpropylphenylthiocarbamide, Diphenylpyrroylcrotolactone, 1000. Diphenyl-β-pyrroylpropionic acid, 1000 Diphenylquinoline,  $a\beta$ -, 1142. Diphenylrosamine, 158. Diphenylselenone, 34. Diphenylsuccinic anhydrides, 1135. Diphenylsulphideorthocarboxylic acid, 1292.Diphenylsulphonebromopropane, 988. Diphenylsulphonemethane, 56. Diphenylsulphonethylamine, 380. Diphenylsulphonisopropyl alcohol, symmetrical, 780. Diphenyltetrazine, nitro-, Trans., 51 Diphenylthiocarbamide, action of allyl bromide on, Trans., 303. action of benzyl chloride on, TRANS., 297. Diphenylthiocarbazinic acid, 1260. Diphenylthiosemicarbazide, metanitro-, parabromorthonitro-, 152. Diphenyltolylenedicarbamide, 760. Diphenyltricyanocarboxylic acid, 1252. Diphenyltrimethylene cyanide, aa'-, 384. Diphthalylditrimethylenetriamine, 976. Dipropionamide, 726 Dipropionylnaphthylenediamine, 1115. Dipropionylorthodiamidotoluene, 1115. Dipropylamido-y-disulphide hydrochloride, 472, 1090. Dipropylcarbamide, 476. Dipropyldiphenyldiketodihydroparadiazinecarboxylic acid, 270. Dipropyldisulphide-y-diphthalamic acid, 472. Dipropylglutaric acid, 879. Dipropylthiocarbamide, 476. Dipseudocumyltetrazine, Trans., 56. Dipyrogallopropionic acid, 982. Diquinoyltetroxime, 1403. Diresorcinyl tetrabenzoate, 136. Disazobenzeneparachlorophenylhydrazine, tetranitronitroso, 1119. Disinfectant powders, carbolic, examination of, 300. Dispersion, anomalous, rotatory, in iron, cobalt, and nickel, 673. of acids of the acetic series, 1353. - of alcohols of the fatty series, 1034. of allylbenzene- and propenylbenzene-derivatives, 748. - of carbon-compounds, 1353. - of phosphorous oxide, TRANS.,

Dispersive power and molecular re-

fractive energy of aromatic derivatives with saturated lateral chains, relation between, 1201.

Dispersive power of aqueous solutions, 673.

Dissociation of amine hydrochlorides and salts of the fatty acids in solution, 684.

--- of salts containing water, 206.
--- of substances in solution, 325.

— tension, compounds which have a, equal to the vapour pressure of their saturated solution, 553.

theory, studies in chemical optics

with reference to, 313.

Dissolution, heat of, of sulphuric acid solutions, Trans., 94—114, 165—177.

Distillation, fractional, under reduced pressure, apparatus for, 329, 556.

of wood, products of the, 956. Disulphones, 55.

Diterpodilactones,  $\alpha$ - and  $\beta$ -, 873.

Diterpolactonic acids,  $\alpha$ - and  $\beta$ -, 873. Diterpoxylic acids,  $\alpha$ - and  $\beta$ -, salts of,

873, 874.
Diterpylic acid, α-, 874.
Dithiodibutyramide, γ-, 1221.
Dithiodibutyric acid, γ-, 1221.
Dithionaphthol, αα-, 1306.
Dithioxamide, 29.

Dithymol, 1403.
Ditolubenzylthiocarbamide, ortho-, 978.
—— para-, 969.

Ditoluene, dinitroso-, 1122.

Ditoluidotoluquinone, 912. Ditoluylene sulphoxide, para-, 1136.

Ditolyl, diamidopara-, action of nascent nitrous acid on, 38.

— dihydrosulphide, ortho-, 606. Ditolylcarbamide, ortho-, 1285.

Ditolyldiamido-orthodiazothiole, ortho-, and its derivatives, 527.

---- para-, 527.

cyanide, para-, 527.nitrosopara-, 527.

Ditolyldiketodihydroparadiazine, para-, 269.

Ditolyl-αβ-diketopiperazine, para-, 1162.

Ditolyl- $\alpha\gamma$ -diketopiperazine, ortho-, 1285.

---- para-, 1284.

Ditolylethyltriazole, para-, 271.

Ditolylketoxime, para-, 1412.

Di-tolylmethyltriazole, para-, 271. Di-tolylphenyltriazole, para-, 271.

Ditolylpiperazine, 1161.

Ditolylpiperazines, ortho- and para-, 1333.

Ditolyltetrazine, dibromopara-, TRANS., 51.

Ditolyltetrazine, nitroortho-, Trans., 54.

— nitropara-, Trans., 51.

---- ortho-, Trans., 52.

para-, and its derivatives, TRANS.,

Ditolyltetrazinesulphonic acid, ortho-, Trans., 53.

Ditriazole derivatives, 271.

Di-trimethylenephenyltriamine, 976.

Diuretin, 1475.

---- analysis of, 1475.

Divalolactone, 867.

Divalonic acid, 868.

Dixylyldiamido-orthodiazothiole, meta-, 528.

Dixylyldiketodihydroparadiazine, para-, 269.

Dodecahydrotriphenylbenzene, 1423.

Dog, hæmoglobin of the, 273.

— urine of the, nitrogenous constituents of, 279.

Dog-fish, formation of urea in, 1451. Dropsy, nature of the effusion in, 1173.

Drugs, estimation of ash in, 833.

Drying apparatus for fodders containing drying oils, 671.

—— substances under diminished pres-

sure, 1185. Durylanilide, 759.

Dyes of the benzeïn-group, 157.

Weselsky's resorcinol, 156. Dyslyte, 872.

# E.

Earths, rare, estimation of, 565. Ecgonine, oxidation of, 1449.

Effusions, pathological, 1173.

Egg, detection of the colouring matter

of the yolk of, 840. Egg-substance, estimation of, 840.

Egg-yolk, heat of combustion of, 938.

Egyptian blue, 215.

Eikosihydrotriphenylbenzene, 1423.

Elaïdic acid, addition of chlorine and halogen acids to, 1396.

Electric arc, action of, on gases, and its employment for demonstrations, 1047.

—— discharge, prolonged action of, on iodine, 687.

Electrical conductivity as a means of investigating the interaction of acids of complex function, 204.

change of, in freshly-prepared solutions, 204.

ozone, 676.

of aspartic acid, 204.

— of distilled water, 1357.
— of fused and solid salts,

1037.

Electrical conductivity of hydrogen chloride in different solvents, 97.

— of phenols and hydroxyben-zoic acids, 677.

— — of solid mercury, 98.
— — of solutions of boric acid containing mannitol, 1357.

 of solutions of cadmium salts, 1203.

- --- of some solutions at temperatures between 18° and 100°, 676.

- of substituted succinic and glutaric acids, 1038.

- - of sulphuric acid solutions,

Trans., 86-88, 158-160. - - of the ammonium and aniline

salts of the hydroxybenzoic acids, 1039. -- current, oxidation of sulphides by,

- discharge, silent, effects of the, 1358.

properties of semi-permeable walls, 1354.

- resistance of gases, influence of a magnetic field on, 1359.

- --- of iron and its alloys at high temperatures, 549.

- - of nitrogen peroxide, variations in the, with rise of temperature,

- - of the alloys of ferromanganese and copper, 1356.

Electricity, development of, in electrolytes, 677.

passage of, through hot gases,  $103\bar{7}$ .

Electrochemical effects on magnetising iron, 678.

Electrochemistry of some organic acids,

Electrodes, platinum, maximum polarisation of, in sulphuric acid, 316, 675. - polarisation of, in dilute

sulphuric acid, 551, 676. - polarisation of, 933.

Electrolysis of a mixture of two salts in aqueous solution, 678.

of aluminium fluoride in igneous fusion, 1040.

- of fatty acids, 1236.

- of fused aluminium oxide and fluoride, 552.

— of hydrogen carbonates, 1204. — of mixed solutions, 317.

- of potassium ethyl malonate and ethyl potassium succinate, 583.

of silver chloride dissolved in sodium thiosulphate, 1204.

with semi-permeable walls, 1354. Electrolytes, binary, difference of potential between two dilute solutions of, 1355.

Electrolytes, conditions of equilibrium between, 437.

- development of heat and electricity in, 677.

- different, surface tension of polarised mercury in, 552.

Electrolytic cells, resistance of, 317.

- estimations and separations, use of double pyrophosphates in, 294.

separations, 294, 664, 1028, 1029. Electrometer, Lippmann's capillary,

limits of accuracy of, 552. Electromotive force of metallic salts,

- seat of the variation of, with temperature, 1035.

forces, changes in, produced by changes of concentration of the exciting liquid, 1035.

- of cells containing mixed salt solutions, 202.

Element, new, evidence of a, in tellurium, antimony, and copper, 434.

Elements, atomic refraction of, 313. - relation between the atomic volume of, and the influence of, on steel, 567.

- structure of the line spectra of, 674.

Eleonorite, 219.

Embryo and endosperm, relation of. TRANS., 474.

 form in which reserve starch enters, TRANS., 513.

— localisation of the secretion of diastase in the, TRANS., 493.

visible changes in, during germination, TRANS., 466.

- young, secretion of an amylohydrolyst (diastase) by, Trans., 489.

Embryos, excised, development of, on

foreign endosperms, Trans., 478.

— of barley, culture of, on nutrient solutions, Trans., 483.

- culture of, on water, Trans., 482.

Emetine, assay of, in ipecacuanha wine, 310, 548.

Endosperm and embryo, relation of, TRANS., 474.

- function of the starch of TRANS., 478

· visible changes in, during germination, Trans., 466.

Endosperms, foreign, development of excised embryos on, Trans., 478.

Endothermic reactions, spontaneous, and Berthelot's law of maximum work,

Ensilage, experiments on, at Woburn,

Enstatite, 19.

Ethoxy-a-stilbazole, 1439.

Enzymes, TRANS., 835. - hydrolytic, origin of the, of germinated grain, TRANS., 511. Epidote as a rock-forming mineral, - from Syphnos, 344. Equilibrium between hydrogen, chlorine, and oxygen, 8. - chemical, between hydrogen chloride and hydrogen in conjunction with metals, 685. - in homogeneous solutions when unequally heated, 444. Equivalents, optical, 433. Erythrane, constitution of, 730. Erythrene, constitution of, 730. Erythrol, action of, on alkali alkyloxides, 935.--- bromide, 730. - derivatives of, 730. --- heat of formation of the sodium derivatives of, 935. - heats of combustion and formation of, 1360. Essential oils, Maumene's test for, 834. Etard's reaction, 978. Ethane derivatives, stereochemistry of, 1083. Ethanediquinolyline, 1007. Ethenylanilidoxime, 43. Ethenylbromotoluyleneamidine, 976. Ethenyldiphenylamidine, 371. Ethenyldiphenylsulphone phenyl sulphide, 988. Ethenylditolylamidine, 371. Ethenylethylorthophenylenediamine, 612. Ether, action of light on, TRANS., - action of ozone on, Trans., 584. — conditions under which hydrogen peroxide is formed from, TRANS., 574, 988, PROC., 1889, 134. - slow combustion of, Trans., 585. - vinyl alcohol a constant constituent of, 118. Ethereal oils, 1314. — iodine absorption of, 199. reactions of, 199. ----- salts, decomposition of, in the alimentary canal, 1013. - - production of, by fermentation, 1454. Etherification by uranium salts, 727. Ethers, dispersion of, 1353. Ethoxyacrylic acid from a-dichloropropionic acid, 957. Ethoxybenzamide, 975. Ethoxybenzyleneanthrone, 1425. Ethoxycaffeine, 1166.

Ethoxyhydrocotarnine methiodide, 531.

Ethoxypiaselenole, 161.

Ethyl acetate, amido-, 1268. acetanilidoacetate, 1415. α-acetanilidopropionate, 1416. - acetoacetate, action of alcohols on, 1096. - action of, on cinnamaldehyde, 768. - action of, on dextrose in presence of alcoholic ammonia, 732. - --- condensation of carbamide with, 1249. derivatives of, 27.
haloïd derivatives of, 1238. - acetoneoxalate, conversion of, into symmetrical hydroxytoluic acid, 364. - acetylmalonate, action of, on benzamidine, 496. -acrylate, conversion of, into \$alanine, 862. adipate, synthesis of, from ethyl potassium succinate, 583. -- alcohol, nitro-, 857. - amidothiazylacetate, 1238. — β-amyloxyquartenylate, 865. - anilomethyloxalacetate, 379. aniloxalacetate, 378. – anilpyrroylpyruvate, 1243. - anisenylamidoximecarboxylate, 145. — benzenylamidoximeoxalate, 258. benzenylazoximemethenylcarboxylate, 259. - benzoate, amido-, salts of, 1267. - benzylbutenyltricarboxylate, 774. benzylethenyltricarboxylate, 774. – – benzylisobutenyltricarboxylate, 774. benzylpropenyltricarboxylate, 774. — bromanilidodinitrophenylmalonate, a-bromisobutyrate, action of, on ethyl propylmalonate and isopropylmalonate, 1103. bromisovalerate, action of trimethylamine on, 956. a-bromobutyrate, action of triethylamine on, 234. bromodinitrophenylacetoacetate, 772. bromodinitrophenylmalonate, 377. a-bromopropionate, preparation of, — bromotrinitrophenylmalonate, 497. — bromundecylenate, 1237. - butenyltricarboxylate, 743. - butyrate, production of, by fermentation, 1455. - α-butyrobutyrate, 235. -- camphoroxalate phenylhydrazone. TRANS., 655. - camphorylmalonate, 1150.

- Ethyl carbamate in the alcoholic extract of normal urine, 654. — chloranilate, 136. — chlorobutenyltricarboxylate, 1101. ----- chloroformate, chlorine substitu-tion products of, 1095. ---- chloropropenyltricarboxylate, 1101. ---- chloroxalate, 236. --- cyanacetate and benzaldehyde, condensation products of, 1270. cyanate, molecular weight of, 725. - cyanodiphenylsuccinate, 504. - cyanurate, molecular weight of, 725.— αβ-diacetopropionate, 863. - diacetoxysuccinosuccinate, 986. — diacetoxyterephthalate, 986. --- αα<sub>1</sub>-diacetyladipate, Trans., 204, action of phenylhydrazine on, TRANS., 221. - decomposition of, by heat, Trans., 224. -  $\alpha\omega$ -diacetyl- $\alpha\omega$ -diethylpimelate, TRANS., 30. — αω-diacetylvalerate, TRANS., 228.
   — hydrolysis of, TRANS., 229. — diallyldicarboxyglutarate, 879. dibenzoyloxypyromellitate, 985. a-dibenzoyloxysuccinosuccinate, 986. - dibenzoyloxyterephthalate, 986. - dibenzoylsuccinate, preparation of, Trans., 949. dibenzyldicarboxyglutarate, 879. dibenzyloxyterephthalate, 986. - dibromadipate, TRANS., 372. dibromodinitrophenylmalonate, 982. · dicarbanilidodibromohydroquinonedicarboxylate, 500. - dicarbanilidodichlorohydroquinonedicarboxylate, 499.

  — dichloradipate, Trans., 939. - dichloropyromucate, 600. - B-dichloropyromuconate, TRANS., 933. dicyanacetate, 1395. — diethyldicarboxyglutarate, 878. - dihydrodiamidopyromellitate, 983. dihydrodibenzoyloxypyromellitate, dihydrodibenzoyloxyterephthalate, a-dihydrodibenzyloxyterephthalate, 986. dihydrogen hydrocamphorylmalonate, 1151. - dihydroxyterephthalate, 986. - diimidodiethyladipate, Trans., 218. — dimethoxyterephthalate, 986.
  - 117. 2:5-dimethylpyrrolinecarboxylate, formation of, 1155. dinitrophenylacetoacetate, 1418. diphenacylacetoacetate, 258. diphenylhydrazinediacetyladipate, TRANS., 221. dipropyldicarboxyglutarate, 878. - disodiodiacetyladipate, TRANS., 216. - disodiotartrate, 595. - ethenyltricarboxylate, 742. - physical constants of alkyl derivatives of, 745. - ether. See Ether. --- ethylbutenyltricarboxylate, 744. - ethylethenyltricarboxylate, 743. ethylimidoethylphenylthiocarbamate, 1291. – ethylisobutenyltricarboxylate, 744. ethylpropenyltricarboxylate, 743. - fluorides, hydrates of, 1386. - formanilidoacetate, 1415. - fumarate, action of methylamine on, 869. --- α-heptoheptoate, 235. - homobenzenylamidoximecarboxylate (para-), 48. hydrocamphorylmalonate, 1151. - hydrochloranilate, 1271. - hydrogen oximidosuccinates, isomerism of, 350. hydroxyphenyldiphenylpyrrolinecarboxylate (ortho-), 264. hydroxytetrate, 739. imidoethylphenylthiocarbamate, 1291. - imidophenylthiocarbamate, 1291. - iodacetoacetate, 28. - iodide and triethylamine, effect of various solvents on the velocity of reaction between, 1366. ---- a-isoamyl-\$-amidocrotonate, 1097. - isoamylmalonate, 1099. - isobutenyltricarboxylate, 743. ----β-isobutoxyquartenylate, 865. — α-isobutyl-β-amidocrotonate, 1097. — isobutylparaconate, 874. isohexenyltricarboxylate, 744. isomuconate, Trans., 374. a-bromisobutyrate on, 1103. lactate, production of, by fermentation, 1455. - maleate, action of methylamine on, - malonate, preparation of mono-,

Ethyl aa'-dimethyl-aa'-diacetylpimelate,

dimethyldicyanoglutarate, 132.

— dimethylpimelate, Proc., 1890,

dimethyldicarboxyglutarate, 878.

Proc., 1890, 117.

di-, and tri-substituted succinic acids from, 742. Ethyl mercaptan, action of phenylthiocarbimide on, 500. β-methoxyquartenylate, 865. --- α-methyl-β-amidocrotonate, 1097. — methylbutenyltricarboxylate, 743. - methylenemalonate and its isomeride, 364. - methylethenyltricarboxylate, 742. - methylisobutenyltricarboxylate, methyloxalacetate, action of aniline on, 378. - methylthiazylacetate, 1238. - a-naphthenylamidoximecarboxylate, 63. -  $\beta$ -naphthenylamidoximecarboxylate, 62. – α- and β-naphthyldiphenylpyrrolinecarboxylates, 263. nitracetoacetate (?), 28. - nitrite, estimation of, in spirit of nitrous ether, 927. - nitrobenzenylamidoximecarboxylate (para-), 45. - nitrobenzylcarbamate (para-), 487. — orthoformate, 582. — oxalacetate, action of aniline on, 378. action of bromine on, 133. --- oxalenediuramidoxime dicarbonate, 124. – phenacylisoamylmalonate, 1100. - phenylacetylhexamethylenecarboxylate, Trans., 319. phenylallenylamidoximecarboxylate, 42. phenylbromacetate, 1135. phenylcarboxysuccinate, 1135. phenylenedi-diphenylpyrrolinecarboxylate (para-), 264. phenylhexamethylenedicarboxylate, Trans., 315. phenylhydroxyacetate, 1135. phenylmethylhydroxypyrimidineacetate, 69. phenylmethylhydroxypyrimidinepropionate, 70. - phenylparaconate, 894. a-phenylsulphonebutyrate, preparation of, 781. – phosphite, 858. γ-phthalimidopropylmalonate, 1129. potassium malonate, electrolysis of, succinate, electrolysis of, 583. ·--- propenyltricarboxylate, 742.

- synthesis of mesaconic and citraconic acids from, 1101.

α-propiobutyrate, 235.

---- β-propoxyquartenylate, 865.

Ethyl propylmalonate, action of ethy a-bromisobutyrate on, 1103. – propylparaconate, 872. pyromucate, chloro-derivatives of, 482. - pyrroylisonitrosopropionate, an hydride of, 1156. - pyrroylpyruvate, 1000, 1156. pyrryl phenyl pyrazole carboxylate,1244. quinolineparamethenylamidoximecarboxylate, 175. salicenylamidoximecarboxylate, 146. sodacetoacetate, action of picric chloride on, 1418. sodiophenylsulphonacetate, placement of the sodium of, by alkyls, 781, 1137. — sodiotartrate, 595. succinate, synthesis of, from ethyl potassium malonate, 583. succinosuccinate and allied compounds, alleged tautomerism of, 983. - tartrate, action of alkali ethoxides on, 595. - terpenylate, 873. tetracarbanilidotetrahydroxyterephthalate, 500. tetramethylenetetracarboxylate, 879. · thioacetate, 582. - thioacetoacetate, action of phenylhydrazine on, 796. - formation of, 28. tolyldiphenylpyrrolinecarboxylate (ortho- and para-), 263. · tricarbanilidophloroglucinoltricarboxylate, 500. - trichloropyromucate, 601. trinitrophenylacetoacetate, 1418. trinitrophenylenedimalonate, 498. – undecylenate, 1237. — valerovalerate, 235. xylenylamidoximecarboxylate, 50. - xylylchloromalonate (meta-), 499. - xylyldiphenylpyrrolinecarboxylate (meta-), 263. - xylylmalonamate (meta-), 498. - xylylmalonate (meta-), 498. xylylmalonmethylamate (meta-), 498 Ethylacetanilide, 758. Ethylallylthiocarbamide, 477. Ethylamidoethylpiperonylcarboxylic anhydride, Trans., 1035. Ethylaniline, 758. - orthonitro-, 611. - orthonitronitroso-, 612. Ethylazimidobenzene, 612. Ethylbenzamide, 43. --- β-chlor-, 1267.

Ethylbenzamide, para-, 975. Ethylbenzene, action of chromyl chloride on, 978. action of ethylmalonic chloride on, derivatives of, 134. — isomeric derivatives of, 54. Ethylbenzenemetasulphonic acid, 54. – orthobrom-, 55. — ---- parabrom-, 55. Ethylbenzeneparasulphonic acid, 54. Ethylbenzoyldextroecgonine, 913. Ethylbenzoylenecarbamide, 1254. Ethylbenzylanilinesulphonic sodium salt of, 611. Ethylbromopiperonylcarboxylic anhydride, ω-amido-, Trans., 1017. Ethylcoumarin, 777. thio-α-, 624. Ethylcoumaroxime, a., 624. acetate, a-, 624. Ethylcoumarphenylhydrazide, a., 624. Ethylerotonic acid,  $\beta$ -thio-, 361. Ethyldextrococaïne aurochloride, 913. Ethyldiacetylpyrroline, tertiary, 1430. Ethyldibromomaleïmide, 907 Ethyldimethylsuccinic acid, 743. Ethylene bromide, action of ammonia on, 952. glycol, oxidation of, in alkaline solution with lead peroxide, 20. - imidophenylthiocarbamate, 1292. --- selenide, 950. ---- tetraphenyl hexacyanide, 1253. Ethylenediaminedibromopraseocobalt salts, 953. Ethylenediaminedichloropraseocobalt salts, 953. Ethylenediaminedichlorovioleocobalt salts, 953. Ethylenedi-a-naphthyldiamine, action of chloracetic and oxalic acids on, 1162. Ethylenedi-\(\beta\)-naphthyldiamine, 1333. Ethylenediparaethoxydiphenyldiamine, Ethylenediphenyldiaminesuccinic acid and aniline, reaction of, 1164. Ethylenelactic acid, 128. - from flesh extract, 235. Ethyleneorthoditolyldiamine, action of chloracetic acid and oxalic acid on, Ethyleneparaditolyldiamine, action of chloracetic and oxalic acids on, 1162. Ethylenephenylhydrazine, 250. Ethylenephenylhydrazinedisuccinic acid, Ethylene-\psi-selenocarbamide, 880. Ethylenetetraphenyldithiosemithiocarb-

azide, 251.

Ethylenetriphenylthiosemicarbazide,

Ethylformanilide, 758. Ethylglycolylamidocumic acid, meta-, Ethylglycolylparatoluidide, 269. Ethylglycolylparaxylidide, 269. Ethylhydrasteine, 533. Ethylhydrastine, 74, 649. ethiodide, 533. hydroxide, 1169. Ethylhydroberberine, 1012. Ethylhydroxyxanthine, 32. Ethylidene trichlorolactate, tetrachlor-, Ethylideneanisenvlamidoxime, 145. Ethylidenebenzenylamidoxime, 44. Ethylidenebromophenylsulphone, 381. Ethylidenechloroparatolylsulphone, 380. Ethylidenechlorophenylsulphone, 379. Ethylidenediethylsulphone, 55. chloride, 55. Ethylidene metanitrophenylhydrazine, Ethylidene-β-naphthenylamidoxime, 62. Ethylideneparahomobenzenylamidox-Ethylideneparanitrobenzenylamidoxime, 46. Ethylidenepropionic acid, 585. Ethylisobarbituric acid, 32. Ethylisocrotonic acid,  $\beta$ -thio-, 361. Ethylisophthalic acid, 1283. Ethylitamalic acid, salts of, 588. Ethylmalonic chloride, action of, on ethylbenzene, 493. Ethylmercaptomethylthiazoline, 860. Ethylmethyldihydropentene methyl ketone, TRANS., 251. Ethylmethylhexamethylene, a-iodo-, Trans., 23. Ethylmet hylnitrouracil, 32. Ethyl-2-methylpyrrolidone-2-carbothio-xylamide, [1], 793. Ethyl-2-methylpyrrolidone - 2 - carboxyl-amide, [1], 793. Ethyl-2-methylpyrrolidone-2-carboxylic acid, [1], 793. Ethyl-3'-methylquinoline-1-carboxylic acid, [2'], 1326. Ethylmethylsuccinic acid, symmetrical, Ethylmethyluracil, 31. Ethylnaphthalenecarboxylamide, -, 158. Ethylnaphthylamine, \(\beta\)-nitroso-\(\alpha\)-, 631. Ethyl- $\beta$ -naphthylhydrazine, 61. Ethylnitroüracil, 32. Ethylorthophenylenediamines, 612. Ethylorthotolylsemithiocarbazide, TRANS., 262. Ethyldibromomaleïmide, 907. Ethylparaconic acid, 587. Ethylparanitrobenzenyloxime nitrite, 46. Ethylphenol, ortho-, 134.

Ethylphenol, para-, 54. Ethylphenolmetasulphonic acid, derivatives of, 55. Ethylphenyl propyl ketone, 493. Ethylphenylnaphthaleneazammonium iodide, 787. Ethylpiperonylcarboxylicacid, ω-amido-, action of heat on, Trans., 1058. action of methyl iodide on, TRANS., 1059. action of nitrous acid on, TRANS., 1060. - --- preparation of, TRANS., 1053. - salts of, with acids, Trans., 1056. – ω-chlor-, Trans., 1029. - anhydride, ω-amido-, TRANS., 993, 1013. - fusion of, with potash, TRANS., 1015. opianate of, Trans., 1082. pseudopianate of, Trans., 1076, 1080. - mitrosoamido-, Trans., 1018. Ethylpropargylamine, 230. Ethylpropylene,  $\beta$ -thio-, 361. Ethylpyridinedicarboxylic acid, 795. Ethylpyrroline, [1-], 907. Ethylpyrrolines, 65. Ethylquinol, thio-, 604. Ethylquinoline-3: 4'-dicarboxylic acid, 1325. Ethylrosinduline, 908. Ethylsuccinic acid, 742. Ethylsulphoncyanamide, 502. Ethylsulphonic acid, preparation of, 748. Ethylthiocarbamideallyl cyanide, 1104. Ethylthiocarbamidebenzyl cyanide, Ethylthiocarbamideethyl cyanide, 1104. Ethylthiocarbamidepropyl cyanide, Ethylthio-\(\beta\)-dinaphthylamine, 1307. Ethyltrimethyltetrahydroquinoline, Ethyltriphenylbromopyrrolone, crystallography of, TRANS., 736. Ethyltriphenylpyrrolone, Trans., 704. — action of bromine on, Trans., 705. — crystallography of, Trans., 730 Ethylxylenes and their derivatives, 882. Ethylxylenol, 883. Eucalyn, identity of, with melibiose, 227. Eucalyptus honey, 122. Eugenol, 966. ethyl ether tribromide, 639. presence of, in sassafras oil, 1111. Fermentation, acetic, action of light on, Eukairite from Argentine, 948. 1181. Eulyte, 872.

Eurhoding constitution of, 1265.

VOL. Lvill.

Eurhodines, formulæ of, 1444. Euxanthic acid, constitution and properties of, 505. Euxanthone, properties of, 506.

synthesis of, 506. Euxanthone-group, 504. Euxanthone-series, compounds of, 389. Evaporation by aid of heat applied from above, 5. Expansion by heat of sulphuric acid solutions, TRANS., 114-121, 177-184.

Extraction apparatus, 663. F. Fabrics, dyed, estimation of indigo in, Fairfieldite from Branchville, 1072. Fat, absorption of, 1171. absorption of, in the intestine, 183. - estimation of, in milk, 837. - estimation of, in milk in dairies, 1346. - estimation of, in poppy cake, 306. - estimation of, in sour milk, 304. ---extraction apparatus, simplified, 304. — extraction of, from milk solids 91. — in milk, volumetric estimation of, 92. — of bone marrow, 652. — rapid estimation of, in milk, 304. Fats, analysis of, 91, 929. ---- detection of cotton-seed oil in, 930. - different, absorption of, by the alimentary canal, 811. - estimation of, in feeding stuffs, 930. examination of, 1347, Proc., 1890, 72, 91. - ferments which decompose the, in plants, 1455. - melting and solidifying points of, 929.— neutral, estimation of, 200. — of fodder, composition of, 657.
— optical examination of, 91. Favalite, artificial, 20. Feeding stuffs, agricultural, artificial digestion of, 1451. Felspars, barytic, from Sweden, 343. Fergusonite, from Llano Co., Texas, 459. Ferment, diastatic, of ungerminated wheat, 650. - of the liver, 185. — inverting, in koji, 281. - which destroys sugar, presence in chyle of a, 810. Ferment action of bacteria, 916.

5m

alcoholic, formation of hydrogen

sulphide during, 1454.

Fermentation of invert sugar, 950. aldehyde as the chief product of a,

- ammoniacal, of uric acid, 1399.

- by the fungus of the lily of the valley, 1179.

- influence of carbonic anhydride on the products of, 281.

— marsh gas, 855.

--- mucous, 76.

— of cranberry juice, 1455.

- of glycerol and mannitol, 915.

--- of manure in absence of oxygen, 282.

- of nitrogenous matters, loss of nitrogen in, 1340.

— of raffinose by beer yeast, 22.

- of sugar, formation of paralactic acid during, 78.

 production of ethereal salts during, 1454.

Ferments, anaërobic, decomposition of albumin by, 78.

- - decomposition of gelatin by, 543. - fat-decomposing, in plants, 1455,

----- hydrolytic, terminology of, TRANS., 528.

- unorganised, TRANS., 835.

Ferric antimonate, 216.

---- carbonylferrocyanide, 117.
----- chloride, reduction of, by boiling,

- hydroxide, action of, on aluminic and ferric salts, 946.

- - colloïdal, molecular weight of, 1216.

- oxide, influence of, on the decomposition of potassium chlorate, TRANS., **27**8.

- precipitation of, by ammonia, 420.

oxychloride, crystallised, 1063.

--- phosphate, tetrahydrated, formation of, 292.

--- potassium arsenate, 1378.

---- pyroarsenate, 1378.

---- sodium arsenate, 1378.

--- thiosulphate, 330. Ferricyanides, volumetric estimation of,

Ferro-aluminium, analysis of, 1471.

Ferrocyanide, estimation of, in gas-lime,

Ferrocyanides, estimation of, in the byeproducts of gas works, 834.

Ferromanganese and copper, electrical resistance of alloys of, 1356.

Ferronatrite, 455.

Ferrostibian from Örebrö, 1075. Ferrous sodium thiosulphate, 12.

--- thiosulphate, 12.

Fertility, decrease of, by growth of tobacco, 1340.

Fibrin, blood and vegetable, heat of combustion of, 938.

heat of combustion of, 938.

Fibrin-ferment, action of, 1175.

Fibroferrite, 456.

Fibroïn, heat of combustion of, 938.

Fightelite, constitution of, 385.

properties of, 384. Filicic acid, constitution of, 162.

Fillowite from Branchville, 1072.

Films of vaporised metal, 692.

Filter holder for drying and weighing,

Fish, dog-, formation of urea in, 1451.

 influence of cooking on the digestion of, 1450.

Fishes, gases in the swimming bladder of, 183.

Flame, production of ozone by, Proc., 1890, 26.

violet, produced by common salt in a coal fire, 1202.

"Flaveanwasserstoff," 351. Flax, constituents of, Trans., 196.

Flax-fibres, discrimination of jute-fibres from, 928.

Flesh, heat of combustion of, 938.

Flue deposits, manganiferous, estimation of zinc in, 394.

Fluid crystals, 106.

Fluorescences, new, 435.

Fluorides, heat of neutralisation of, 1. Fluorindine, 1444.

Fluorine, action of, on different forms

of carbon, 557.

—— colour and spectrum of, 329. —— density of, 208. Fluoroform, 724.

Fluorspar from St. Lawrence Co., New York, 337.

Fodder, &c., estimation of starch in, 1197.

composition of the fats of, 657.

 sweet, production of so-called, 82.

Fodders, acid and compressed, analysis of, 1477.

- acid, loss of nitrogen in, 1339.

- action of dilute hydrochloric acid and of pepsin on the digestible albumin of, 651.

containing drying oils, apparatus for drying, 670.

Food, estimation of ash in, 833.

Foods, detection of benzoic acid in,

 estimation of chromium and barium in, 195.

Forces, molecular, sphere of action of. 105.

Formaldehyde, 1092. - action of hydrogen sulphide on, cryoscopic behaviour of sugars synthesis-d from, 465. preparation and properties of, 954. - sodium hydrogen sulphite, 1092. Formanilide, alkylation of, 1258. -- pariodo-, 1415. Formanilidoacetic acid, 1415. Formanilidopropionic acid, 1415. electrochemistry Formic acid. and thermochemistry of, 99. Formopariodosnilide, 1258. Formose, molecular weight of, 466. Formulæ, space-, 719. Formyldeoxybenzoïn, 359. Formyldiethyl ketone, 357. Formylethyl phenyl ketone, 358. Formylpropyl phenyl ketone, 358. Francein from 1:2:4-trichlorobenzene, 51. Franceïns, new data relating to, 51. Frangulin, TRANS., 38.

—— hydrolysis of, TRANS., 45. - preparation of, Trans., 41. Free surface of liquids, increase of chemical energy at, 328. Freezing of colloïdal solutions, 685. - point of a solvent, lowering of, 846. of isomorphous mixtures, 1209. points of solutions, law of, Proc., 1890, 9. - of sulphuric acid solutions, TRANS., 331. Fructosecarboxylic acid, 599. Fucose, an isomeride of rhamnose, 1393. Fucus, sugar from, 1105. Fucus vesiculosus, gases contained in the bladders of, 916. - iodine in, 402. Fucusaldehyde, identity of, with furfuraldehyde, 1242. Fucusol, 33, 238, 1105. Fumaric acid, conversion of maleic acid into, 1397. - synthesis of, 594. - and maleïc acids, isomerism of, - diparatoluidide, 1163. Fumarine, 272.
Fungus of the lily of the valley, alco-

holic fermentation and conversion of alcohol into aldehyde by, 1179.

Fungus-symbiosis of the Leguminosæ,

- derivatives of, 959.

1020.

Furfuracrylamide, 960.

Furfuraldehyde, 1242.

Furfuracrylic acid, bromo-, 960.

presence of, in commercial alcohols, 1400. Furfuraldehydediphenylhydrazone, Furfuraldoxime, two stereochemically isomeric derivatives of, 1266. Furfuran, trichlorobromo-, 601. Furfuran-derivatives and sugars, relation between, 33. Furfuran-group, 1242. Furfurobromacrylic acid, bromo-, 960. Furfurobromethylene, bromo-, 960. Furfurodibromopropionic acid, bromo-, Furfur-β-phenylpropyl alcohol, Furfur  $\beta$ -phenylpropylamine,  $\gamma$ -, 1407. Furfur-β-phenylpropylcarbamide, Furfurphenylethylamine,  $\beta$ -, 1407. Furiloximes,  $\alpha$ - and  $\beta$ -, 1245. Furilphenylhydrazone, 1245. Furilphenylosazone, 1245. Furoïnoxime, 1245. Furoinphenylhydrazine, 1245. Furotolidine, 1299. Fusel oil, American, 859.

Furfuraldehyde, estimation of, 1352.

## G.

— phenylhydrazide, 154.

Galactose and cerebrose, identity of,

Gadolinite from Texas, 457, 458.

Galactonic acid, lactone of, 598.

Galactan, a-, 284.

TRANS., 57.

identity of brain sugar with, 121, TRANS., 57. Galactosecarboxylic lactone, 599. Galactosediphenylhydrazone, 1260. Galaheptose, 599. Gallie acid, oxidation of, 1130. — — phenylhydrazide, 155. — reaction of, 1275. Gallium oxide, action of magnesium on, Gamoose, milk of the, TRANS., 754. Garnet from the South African diamond fields, 1076. Galvanic cell, dichromate, 1354. polarisation, theory of, 314. Gas apparatus, removal of exhausted solutions from, 557. balance, 823. — densities, new method of determining, 321. - heat of solution of a, 846. sampling and testing apparatus, 411. 5 m 2

Gas-battery, new form of, 842.

Gas-burners, new, 106.

Gases, absorption of, by mixtures of alcohol and water 103.

- action of the electric arc on, and its employment for demonstrations,
- apparatus for preparing, 556.
  automatic apparatus for the evolution of, from liquids, 6.
- bottle for washing and absorbing, 288.
- contained in the bladders of Fucus vesiculosus and Ozothellia nodosa,
- evolved in the putrefaction of serum albumin, 78.
- hot, passage of electricity through,
- hydrates of, 1386.
- in the swimming bladder of fishes,
- influence of a magnetic field on the electrical resistance of, 1359.
- influence of acids on the evolution of, by plants, 190.
- refractive indices of, 201.
  simple and rapid preparation of,
- spectra of, at low temperatures, 313.
- titration of small quantities of, in mixtures, 290.
- Gas-generator, self regulating, 847.
- Gas-lime, estimation of ferrocyanide in,
- Gas-liquor, estimation of pyridine bases in, 1349.
- Gas-volumeter, 660.
- Gas-waste, &c., estimation of ferroevanides in, 834.
- Geddie acid, Trans., 59.
- Gedrite from Fiskernäs, Greenland, 19. Gelatin, decomposition of, by anaërobic ferments, 543.
- -- liquefaction of, by bacteria, 916. Geranium oil, Indian, 951.
- Gerhardite, crystallised basic copper nitrate, identical with, 714.
- German silver, analysis of, 418.
- Germination, changes in the embryo and endosperm during, TRANS., 466. - of Jerusalem artichoke, 656.
- --- of seeds, transformation of alkaloïds during the, 543.
- of some of the Gramineæ, TRANS., 458.
- Githago segetum, poison of the seeds of, 1458.
- Glaserite from Douglashall, 18.
- Glass, gradual alteration in, produced by slight alteration of temperature, 440.

- Glass, penetrability of, by water, 691,
- surfaces, influence of, on the velocity of reaction, 1208.
- Glucoctonic acid, 599.
- Glucoheptose, 599.
- Glucolactone, d-, 1398.
- Gluconic acid anilide, 155.
- — optical isomerides of, 1389.
   — phenylhydrazide, 153.
- Gluconic acid, i-, 1391.
- Gluconic acid, 1-, 1389.
- Glucosamine, benzoyl derivatives of,
- Glucose, destruction of, by blood and chyle, 1172.
- conversion of, into sorbite, 1389. - copper solution for the estimation
- of, 198. Glucose, i-, 1392.
- Glucose, 1-, 1391.
- Glucosediphen lhydrazone, 1260.
- Glucosediphenylhydrazone, i-, 1392.
- Glucosediphenylhydrazone, 1-, 1391.
- Glucoses, benzoyl compounds of, 578.
- Glucosides, benzoyl derivatives of, 578.
- Glucosometer, percentage, 300.
- Glutaconic acid, 737.
- Glutarenediamidoxime, 126.
- Glutarenediazoximediethenyl, 126.
- Glutareneimidodioxime, 126. Glutaric acids, dialkyl substituted, synthesis of, 877.
  - electrical conductivity of,
- 1038. Gluten, crude, heat of combustion of,
- Glyceride-hydrolyst, TRANS., 531.
- Glycerol, action of sulphur on, 577.
- commercial, assay of, 835. - estimation of, 198, 299.
- estimation of, in crude glycerol, 300, 425.
- --- estimation of, in soap lyes, 425. - estimation of, in wine and beer,
- 426.
- fermentation of, 915. --- oxidation of, with lead peroxide in alkaline solution, 20.
- test for, 1473.
- Glycerols, synthesis of, by means of hypochlorous acid, 121.
- Glycines, lactones derived from, 245.
- Glycocine, formation of, from chloracetic acid, 1395.
- Glycogen, changes in, in the muscle during work, 185.
- 'ormation and fate of, 810.
- formation of, in a muscle with an artificial circulation, 1335.
- in the liver and muscles, 1334.
- --- molecular weight of, 1215.

Glycollamine, heats of combustion and formation of, 936. Glycollic acid, direct synthesis of, 739. — nitrile, 739. — orthotoluidide, 1161. Glycolylorthotolylglycinamide, 245. Glycolylphenylglycinamide, 245. Glycolylphenylglycine, 245. Glycuronic acid, derivatives of, 1286. Glyoxalinedicarboxylic acid, 1439. Glyoxalmethylphenylosazone, 24. Gold and platinum alloys, liquation of, 947. atomic weight of, 708. - effect of, on the freezing point of tin, TRANS., 348. - estimation of minute quantities of, 830. — native, in calcite, 569. — potassium chloride, anhydrous, 1217. - sulphide, precipitated, composition of, 1217. reactions of, 1217. Gout, latent, Pfeiffer's test for, 401. Grain, estimation of starch in, 928. germinated, origin of the hydrolytic enzymes of, TRANS., 511. Gramineæ, germination of, TRANS., 458. Graminin, molecular weight of, 227. Grape sugar, optical isomerides of, 1389 Graphite, different forms of, and their derivatives, 448. - estimation of carbon in, 923. ---- estimation of, in minerals, 923. Graphitic oxides, 448. Grass oils, Indian, 231. Grasses, composition and digestibility of the proteïds of, 657. seed of, existence of a cellulosedissolving enzyme (cytohydrolyst) in the germinating seed of, Trans., 497. Guaiacol, paranitroso-, 608. Gum, peach, carbohydrates in, 1022.

#### Η.

---- wood-, from straw, &c., 472.

Gum-ferments, nature of, 998.

Gyrolite from California, 343.

--- straw-, 1460.

---- tragacanth, 228.

Hæmatoporphyrin, molecular weight of. 76. Hæmatoxylin, action of chlorine on, Hæmoglobin and oxygen, compounds of, 1450. - carbonic oxide, detection of, 432, 1200.

1565Hæmoglobin, is it present in the free state in the blood plasma of the splenic vein?, 1016. heat of combustion of, 938. — of dog, 273. --- of hen, 274. Hæmoglobins, conditions of absorption of various, 182. Hæmosiderin, 1452. Halogens and oxygen, reciprocal displacement of, 6. free, estimation of, in presence of chlorides and bromides, 825. Haloïd salts of the alkalis, action of sulphuric acid on, in presence of some metallic salts, 289. Hambergite, 1078. Heart disease, nature of the effusions in, Heat, animal, 206. - capacity of sulphuric acid solutions, Trans., 88-94, 160-164. - developed by the action of oxygen on the blood, 274. development of, in electrolytes, 677.- of combustion of acetic acid, 100. — of formic acid, 99.
— of graphitic oxides and pyrographitic oxides, 448. - of isodibutylene and isotributylene, 320. - of organic compounds, and their constitution, 1206. — of organic isomerides, 680. — of rubidium, 679. — of sulphur compounds, 1361. - of the chief nitrogenous compounds in living organisms, 937. - of dissolution of salt solutions, supersaturated, 1042. --- of sodium phosphites and pyrophosphites, 438. - of sulphuric acid solutions, Trans., 94-114, 165-177. - of formation of alkaline succinates and isosuccinates, 320. - — of amides, 1359. - of lithium and silver malonates, 1396, 1397. — of platinic chloride, 439.
— of potassammonium and sodammonium, 319. — — of sodium erythroxide, 935. - - of sugars, 1360. - of uric acid and alkaline urates, 1040.

- of fusion and solubility, relation

- of nitric peroxide, TRANS.,

between, 676.

593.

Heat of hydration of maleïc anhydride, Hexamethylenecarboxylic acid, 738. --- of neutralisation of aluminium and beryllium fluorides, 680. - of bases, where dissociation cannot take place, 553. - of fluorides, 1. - of solution of a gas, 846. ---- of transformation of isomeric inosites, 1041. - of vaporisation, determination of, by means of the steam calorimeter, production in animals, calorimetric investigations on, 182. — specific, of bismuth, 707.
— of supersaturated salt solutions, 1042. - the theory of, and living motors, 807. See also Thermochemistry. Heats of combustion and dissolution of amides, 1360. - - and formation of methyl salts, 101. - of nitrogen compounds derived from the albuminoïds, 936. - of nitrogenous compounds derived from albuminoïds, 936. — of urea, 306. ---- specific, experimental determination of the ratio of the, in superheated steam, 205. Heliophyllite from Sweden, 459. Hemipinic anhydride, TRANS., 1094. Hemp fibres, discrimination of jute fibres from, 928. Hen, hæmoglobin of the, 274. Hepitol, identity of, with perseïtol, Heptamethyldihydropyrrolidine, 1432. Heptamethylene, 727, 728. - amido-, **72**9. Heptolactone, 589. Heptose, 598. Heptyl diphenyl tricyanide, 1252. · nitrite, normal, 353. Heptylenic acid, 589. Heptylic acid,  $\gamma$ -bromo-, 589. Hexabenzoyl- $\beta$ -inosite, 355. Hexacetyl- $\beta$ -inosite, 355. Hexadecylene glycol, 1219. Hexadecylene-derivatives, 1218. Hexadecylenedicarboxylic acid, 1219. - anhydride, 1219. Hexahydrophthalic acid, fumaroïd, 1282. — maleïnoïd, 1282. acids, constitution of, 1277. — anhydride, fumaroïd, 1282. — maleïnoïd, 1283. Hexahydroquinoline, 1320.

Hexamethylene-derivatives, geometrical isomerides of, 1386. Hexamethylene-molecules, configuration of, 1105. Hexamethylphloroglucinol, 1110. Hexane, diamido-, 1001. Hexazoxybenzene, 1117. Hexyl alcohol, new, 473. Hexylamine, new, 473. Hexylbutylene, 594. Hippuric acid, heats of combustion and formation of, 936. Hohmannite, 456. Homobenzenylacetoethenylazoxime, para-, 48. Homobenzenylamidoxime, ortho-, 49. - para-, action of carbon bisulphide on the potassium compound of, 49. Homobenzenylamidoximes, ortho- and para-, and their derivatives, 47. Homobenzenylcarbonylimidoxime, para-, 48. Homobenzenylethenylazoxime, para-, 47. Homobenzenylethoxime salts, para-, 47. Homobenzenylhydrazoximeamido-orthohomobenzylidene, ortho-, 255. Homobenzoyl-orthohomobenzenylamidoxime, ortho-, 255. Homobenzenylphenyluramidoxime, para-, 48. Homobenzenylpropenylazoxime-w-carboxylic acid, para-, 48. Homobenzenylthiouramidoxime, para-, Homobenzenyluramidoxime, para-, 48. Homobetaines,  $\alpha$ - and  $\beta$ -, 747. Homocinchonidine, 1166. Homodibenzenylazoxime, ortho-, 49. Homofluoresceïn, 1111. Homofluorindine, 1445. Homo-orthophthaleneamidimidoxime, Homopiperic acid, synthesis of, 1129. Homoquinine, 1166. Homoterephthalamic acid, 240. Homoterephthalamide, 240. Homoterephthalenediamidoxime and its derivatives, 147. Homoterephthalenediazoximedibenzenyl, 147. Homoterephthalenediazoximediethenyl, Homoterephthalic acid, 240. Homoterephthalisoamic acid, 240. Honey, eucalyptus, 122. unfermentable, dextrorotatory constituent of, 356. Hops, amount of lupulin in, 658. - estimation of lupulin in, 431. Hornblende of St. Lawrence Co., New York, 1073.

Hornblende-schists near Glatz, in Lower Silesia, 1076.

Horse, chemistry of the urine of, 915.

respiration in, during rest and work, 392, 1170.

useful effect of food supplied to, 807.

Human urine, nitrogenous constituents of, 280.

Humus, estimation of, in soils, 688, 832.

—— retention of moisture by, 407. Hunger, influence of, on the exhalation

of carbonic anhydride, 1334. Hureaulite from Branchville, 1072.

Hydantoïn, formation of, 365.

Hydrastic acid, Trans., 1095.

Hydrasteïne, constitution of, 534.

Hydrastine, 74, 532, 534, 1333.

constitution of, 534.ferrocyanide, 1318.

— methiodide, 532, 1167.

— methochloride, 532.

---- methyl hydroxide, 532.

—— salts, 648.

Hydrastinemethylammonium hydroxide, 1167.

Hydratropic acid, 375.

Hydrazine, preparation of, from aldehyde ammonia, 734.

Hydrazines, 148.

- action of chloroform and potash on, TRANS., 50.

Hydrazineuracil hydrochloride, 1241.

Hydrazineuracilcarboxylic acid, 1240. Hydrazobenzene, trinitro-, 40.

Hydrazobenzenedisulphonic acid, 987. Hydrazobenzoic acid, meta-, acids ob-

Hydrazobenzoic acid, meta-, acids obtained by heating, with stannous chloride, 778.

Hydrazones, action of carbon bisulphide on, 248.

Hydrindone, meta- and para-brom-, 1139.

--- metachloro-, 1139.

Hydriodic acid, influence of, on the dissolution of zinc in dilute sulphuric acid, Trans., 824.

Hydroberberine, 1011.

--- ethiodide, 1012.

—— ethochloride, 1012. Hydrobilirubin, molecular v

Hydrobilirubin, molecular weight of, 914.

Hydrobromic acid, preparation of, 687. Hydrobromoxycinchine hydrobromide,

Hydrocamphorylacetic acid, 1151.

Hydrocamphorylmalonic acid, 1151.

Hydrocarbon obtained from carminic acid, constitution of, 1145.

Hydrocarbons, aromatic, action o chlorocarbonylamide, on, 156.

Hydrocarbons, cycloid, structure of, Proc., 1890, 101.

Hydrochelidonic acid, 30.

Hydrochloric acid, detection of free chlorine in, 289, 547.

--- decomposition of, by oxygen on exposure to light, 6.

Hydrochlorides of chlorides, 106.

Hydrocinnamaldehyde, 979.

Hydrocyanic acid, action of, on calomel, 223.

Hydrodesylphenol, Trans., 970.

Hydrofluoric acid, purification of, 687. Hydrofluosilicic acid, titration of, 926.

Hydrofurfuran, constitution of, 730.

Hydrogen antimonide, 209.

----- arsenide, 209.

—————————action of, on potassium permanganate, 1210.

—— carbon as an impurity affecting the estimation of the atomic weight of, 1369.

--- chloride and chlorine, estimation of, when mixed, 412.

and water, simultaneous synthesis of, 8.

electrical conductivity of, in different solvents, 97.

——— density of, 322, 330.

— diphenyl cyanide, 1252. — perbromide, formation of, 6.

— peroxide, action of, on manganese oxides, 946.

acid and the permanganates, 1062.

of, from ether, TRANS., 574, 988.

ether, Proc., 1889, 134.

water to light, Proc., 1889, 134.

molecular weight of, 106.

of, 106.

—— phosphide, action of, on the halogen compounds of arsenic, 1052.

combination of, with boron chloride and silicon sesquichloride, 690.

Hydrogen phosphide, combination of, with boron fluoride and silicon fluoride 448

Hydrogen phosphide, combination of, with silicon bromide and chloride, 559. ---- liquid, 942. - spontaneously inflammable, 942. - solubility of, in mixtures of alcohol and water, 103. - sulphide, distribution of, between the metals of two dissolved salts, 1367. - explosion of, with air or oxygen, Trans., 625. - formation of, during alcoholic fermentation, 1454. - - influence of, on the interaction of zinc and sulphuric acid, Trans., 821. - - occurrence of, in the Stassfurt salt deposits, 336. ---- rhombic sulphur from, 1371. volumetric estimation of, 290. Hydrogenation process, characteristics of, 1304. Hydrolysis, terminology of, Trans., 528. Hydrolysts, Trans., 531. Hydrolyte, Trans., 531. Hydromuconic acid, Trans., 371, 937. · ---- bromo-, 876 Hydromuconic acid,  $\Delta^{\alpha\beta}$ -, 876. Hydromuconic acid,  $\Delta\beta\gamma$ -, 875. Hydrophthalic acids, 1276. Hydropyrogallolbenzein, 899. Hydroquinoline, derivatives of, 177. Hydroquinoline-1-sulphonic acid, 266. Hydroquinoline-3-sulphonic acid, 266. Hydroquinoline-4-sulphonic acid, 266. Hydroresorufin, 157. Hydrosulphides, Proc., 1890, 50. Hydroxamic acids of the fatty series, 127. Hydroxy-acids, α-, and their ethvl salts, action of phenylhydrazine on, 155. Hydroxyacrylic acid, chlorobromo-, 27. Hydroxyadipic acid, chloro-, lactone of, Trans., 940. Hydroxyamidohydroxyquinone chloro-, 493. Hydroxyanilidobenzoic acid, metanitropara-, 375. Hydroxyanilidonaphthalene, 2:2-',629. Hydroxyazo-compounds. 614. Hydroxybenzamide, para-, reduction of Trans., 957. Hydroxybenzidine, 59. Hydroxybenzoic acids, action of aniline on substitution derivatives of, 158. - - electrical conductivities of the ammonium and aniline salts of, 1039. electrical conductivity of, 677. - substituted, action of aniline Hydroxybenzoylphosphinous acid, 618.

Hydroxybenzylphenylcarbamide, ortho-, Hydroxybenzylphthalimidine, para-, Hydroxycamphocarboxylic acid from camphocarboxylic acid, 638. Hydroxycapronamide, γ-, 880. Hydroxycitraconic acid and its derivatives, 29. Hydroxydiketodihydropentene, tribromo-, 1272. Hydroxydimethylethylmetadiazine, formation of, 1159. Hydroxydimethylphenylmetadiazine, formation of, 1159. Hydroxydiphenyl, para-, and its derivatives, 898. Hydroxydiphenylcarbamide, ortho-, 761. Hydroxydiphenylmetadiazine, formation of, 1159. Hydroxydiphenylmetadiazinecarboxylic acid, 68. Hydroxyethylbromonitropiperonylcarboxylic anhydride, TRANS., 1027. Hydroxyethylbromopiperonylcarboxylic acid, ω-, Ťrans., 1025. - anhydride, ω-, Trans., 1025. Hydroxyethylcatecholcarboxylic hydride, ω-, Trans., 1027. Hydroxyethylnitropiperonylcarboxylic anhydride, ω-, TRANS., 1027. Hydroxyethylpiperonylcarboxylic acid, ω-, Trans., 996, 1020. formation of, Trans., 1060. fusion of, with potash, Trans., 1022. - oxidation of, TRANS., 1022. - - salts of, TRANS., 1023. anhydride, ω-, Trans., 1021. Hydroxygluconic acid, 1399. Hydroxy-β-halogen lactic acids, α-, distillation of with water, 736. Hydroxyheptylic acid, 589. Hydroxyhydromuconic acid, lactone of, Trans., 942. Hydroxyindone, brom-, Trans., 400. - benzylamide of, TRANS., 403. · hydrazone and hydrazonehydrazide of, Trans., 402. - β-naphthylamide of, Trans., 403. Hydroxyisobutyramide, tetrachloro-, formation of, 234. Hydroxyisobutyric acid, chloro-, distillation of, with water, 736. Hydroxyisobutyric acid, tetrachlor-, 234. Hydroxyisoheptylic acid, 590.

Hydroxybenzylacetamide, ortho-, 1411.

Hydroxybenzylcarbamide, ortho., 1411.

Hydroxybenzylideneparamidodiphenyl-

Hydroxybenzylamine, ortho-, 1411.

Hydroxyisopropylmethylhydroxypyrimidine, 70.

Hydroxyisopropylphenylhydroxypyrimidine, 70.

Hydroxylamine, compounds of, with metallic chlorides, 558.

configuration of, 1263.

---- hydrochloride, 558.

- thermochemistry of, 934.

Hydro-xylene, meta-, 1314. Hydroxylepidine, ortho-, 1435.

- para-, 1434, 1435.

Hydroxyl-group, influence of certain groups on the thermochemical value of, in the aromatic series, 439.

Hydroxymetadiazines, 68.

Hydroxymethyldiphenylmetadiazine, 68. formation of, 1159.

Hydroxymethylethylmetadiazine, 69.

Hydroxymethylphenylethylmetadiazine,

Hydroxynaphthaquinone [2':1:2], 628. Hydroxynaphthaquinoneimide, chlor-, 1147.

Hydroxynaphthaquinoneoxime [2':1:2], 628.

Hydroxy-a-naphthaquinoneoxime,  $\beta$ chlor-, 1147.

Hydroxy-a-naphthyl hydroxyphenyl ketone, 389, 901.

Hydroxy-β-naphthyl hydroxyphenyl ketone, 389.

Hydroxynitropropylphthalimide, 890. Hydroxyoxydipropionic acid, chloro-,

959. Hydroxypentene cyanide, γγ-hexachloro-α-, 1256.

Hydroxypeutenecarboxylic hexachloro-, 754.

Hydroxyphenyl bisulphide, thio-, 604.  $\mathbf{H}\mathbf{y}$ droxyphenyldimethylglyoxaline,

ortho-, Trans., 10. Hydroxyphenyldimethylsuccinic acid. ortho-, 777.

Hydroxyphenyldiphenylpyrroline, ortho-, 264.

Hydroxyphenylmethylisocrotonic acid,

- ortho-, 778.

Hydroxyphosphinous acids, 618. Hydroxypropylbenzamide,  $\beta$ -, 860. Hydroxypropylphthalamic acid, 472. Hydroxypropylphthalimide, 1089.

Hydroxypyrimidines, 68.

Hydroxyquinoline (kynurin), 174.

 1-, alkyl derivatives of, 174. - — derivatives of, 265.

--- dibromo-1-, 522.

--- dibromo-3-, 523.

---- dinitro-, 523.

---- methiodides, ortho- and para-, 1323.

Hydroxyquinoline, ortho-, action of methyl iodide on, 1323.

- tribromo-, 1**7**7.

Hydroxyquinolinedisulphonic acid, [1-], 268, 523.

Hydroxyquinolines, ortho- and para-, the halogen alkyloxides of, 1323.

Hydroxyquinolinesulphonic acid, [1-],

Hydroxyquinolinesulphonic acid,

[1:4-], 522.— bromo-1 : 4-, 522.

Hydroxyquinolinesulphonic acid, [3-], 523.

– bromo-3-, 523.

Hydroxyquinolinesulphonic acids, 268. Hydroxyquinoneimide, chloramido-, 241.

Hydroxysulphonaphthoic acid, α-, 636.

Hydroxy-a-stilbazole, 1438.

Hydroxy- $\alpha$ -stilbazoline, 1439. Hydroxytetric acid, 739.

Hydroxythymoquinone, a new, 965. constitution of, 884.

Hydroxytoluic acid, symmetrical, conversion of ethyl acetoneoxalate into,

Hydroxytoluyleneorthodicarboxylic acid, lactide of, 1143.

Hydroxytolyl hydroxyphenyl ketone, 389.

Hydroxytolylethylthiocarbamide,  $\omega$ -,

Hydroxytolylmethylthiocarbamide, 178. Hydroxytrimethylglutaric acid lactone,

Hydroxyvaleramide, γ-, 879.

Hydroxyvaleric acid, chloro-, distillation of, with water, 736.

· acids, chloro-, 862.

Hydroxyxanthone, constitution of, 505. Hyoscine hydrochloride, physiological action of, 1019.

Hypochlorites and ammonium salts, interaction of, Proc., **1890**, 22.

Hypochlorous acid, action of light on, Trans., 622.

Hypophosphites, estimation of, 293.

Hypophosphorous acid, oxidation of, by spongy palladium, 690.

Hyposantonin, 904.

Hyposulphurous acid, influence of, on the dissolution of zinc in dilute sulphuric acid, Trans., 822.

Hypoxanthine, 534.

## I.

Iceland moss, constituents of, 600. spar, rate of solution of, in acids, 843.

276.

1570 Idocrase, analyses of, 718. Imperatorine, reaction of, 310. Imidothiocarbamates, 1291. Incineration of vegetable matter, 196. Indazole-derivatives, 781. Indene-derivatives, formation of, from dibrom-a-naphthol, TRANS., 393. - —— synthesis of, 1138. Indian vellow, 504. Indigo, estimation of, in dyed fabrics, synthesis of, from bromacetanilide, 383. — valuation of, 311. Indigo-red, occurrence and detection of, in urine, 1032. Indigotin, estimation of, for commercial purposes, 96. Indium, effect of, on the freezing point of tin, TRANS., 385. - oxide, action of magnesium on, 694. Indole, acetyl-derivatives of, 988. ---- action of methyl iodide on, 1292. - conversion of the homologues of, into quinoline-derivatives, 1322. — methyl-derivatives of, 1292. — nitroso-, 1293. Indolecarboxylic acid,  $\beta$ -, synthesis of, Indoles, methylation of the, 1421. nitro-derivatives of, 897. --- phenylated, 57. Indone, a-brom-, action of aniline on, Trans., 398. - \_\_\_\_ preparation of, Trans., 396. Induline, constitution of, 1265. from fluorindine, 1445. Induline-group, 908. Indulines, 764. Inesite, 460. from Dillenburg, 345. Inosite,  $\alpha$ -, from quebrachite, 226. Inosite,  $\beta$ -, 355. Inosites, heat of transformation of isomeric, 1011. - heats of combustion and formation of. 1360. Insolinic acid, 240. Intercellular matter, 656. Intestinal gases, human, methyl mercaptan in, 540. Intestine, absorption of fat in the, 183. - small, absorption of sugar from,

Inulin in the capitula of composites,

theory

of,

- reaction for, 656.

Inversion by invertase,

Invertan,  $\alpha$ -, TRANS., 894. Invertan,  $\beta$ -, TRANS., 896.

Trans., 918.

Invertan,  $\gamma$ -, Trans., 901. Invertan,  $\delta$ -, Trans., 903. Invertan,  $\epsilon$ -, Trans., 904. Invertan,  $\zeta$ -, Trans., 908. - absorption-spectrum of, Trans., 912. --- molecular weight of, TRANS., 911. Invertan, n-, Trans., 913. Invertan-copper-compounds, Invertan-series, constitution of, Trans., Invertase, 282; Trans., 834, 896. - action of, on cane-sugar, Trans., 843. - effect of heat on solutions of, Trans., 899. - influence of foreign substances on the action of, on cane-sugar, TRANS., 852. — preparation of, Trans., 869. — purification of, Trans., 884. - theory of inversion by, TRANS., 918. Iodic acid, 106, 107. - - and other acids, double salts of, 107. —— preparation of, Trans., 760. Iodides, chlorides, and bromides of the alkalis, distinction between, 289. - estimation of, in presence of chlorides and bromides, 825. Iodine, colour of, in solution, 446. dissolved, molecular weight of, 447. estimation of, 1185.
estimation of, in haloïd salts, 1186. - occurrence of, in Fucus vesiculosus and Chondrus crispus, 402.

— prolonged action of the electric discharge on, 687. - vapour-density of, 1365. water and potassium chlorate, interaction of, Trans., 760. Iodoform, preparation of, 577. Iodole (tetriodopyrroline), molecular weight of, 906. Ions, transfer of, in fused and solid silver iodide, 317. Ipecacuanha wine, assay of emetine in, 310, 548. Iridium, atomic weight of, 1067. --- chloro-salts of, 1068. dioxide, 948. - phosphochlorides, combination of, with arsenic chloride, 1069. — phosphorus bromides, 1383. chlorides, 1068. Irisin, molecular weight of, 227. Iron and aluminium hydrated sesquioxides, relative basicity of, 1062. - and its alloys, electrical resistance of, at high temperatures, 549.

Iron, anomalous rotatory dispersion, in 673.· electrochemical effects of magnet-

ising, 678.

— electrolytic estimation of, 294. estimation of arsenic in, 194.

- estimation of, by means of potassium permanganate in hydrochloric acid solutions, 296.

- estimation of chromium and copper in, 85.

 estimation of free and combined carbon in, 1027.

- estimation of, in blood, 297.

- estimation of, in phosphatic manures, 420.

estimation of, in water, 419.

- estimation of minute quantities of aluminium in, 548.

- estimation of sulphur in, 921, 1463, 1464.

- Götz's method of estimating phosphorus in, 416.

- macro- and micro-chemical reactions of, 296.

- normal storage of, in the liver, 1177.

ores, estimation of zinc in, 1192.

– pyrites, artificial, 338.

- quantity of, in the liver and spleen of young animals, 185.

-salts, effect of temperature on the magnetism of, 678.

- sodium sulphide, 215.

- sulphates, native, from Chili, 454, 456.

volumetric estimation of, 924.

 volumetric estimation of, in ferrum reductum, 827.

 See also Ferric and Ferrous. Isafrole, constitution and reactions of,

Isinglass, heat of combustion of, 938.

Isoamyl chloroxalate, 236. – formanilide, 758.

– phenyloxamate, 236.

— phosphite, 859.

Isoamylacetanilide, 758. Isoamylacetic acid, 1100.

Isoamylacetoacetamide, 1097.

Isoamylaniline, 758.

Isoamylmalonic acid, 1100.

Isoamylphthalamic acid, 890. 1soamylphthalimide, 890.

Isoamylpropargylamine, 230.

Isoanisaldoxime, 1261.

Isoapiole, bromine derivatives of, 1294.

molecular weight of, 725. Isobenzaldoxime, metanitro-, 1262.

Isoberberal, TRANS., 1081.
—— constitution of, TRANS., 1002. Isobornyl phenylcarbamates, 518.

Isobutaconic acid, 875.

Isobutaldehyde and succinic acid, condensation of, 589.

Isobutoxyhydrocotarnine methiodide,

Isobutyl alcohol, compound of sodium hydroxide with, 1222.

-  $\beta$ -chloroquartenylate, 865.

- chloroxalate, 236. ---- phenyloxamate, 236.

— phosphite, 859. — trichlorolactate, 27.

Isobutylacetanilide, 758.

Isobutylacetoacetamide, 1097.

Isobutylaniline, 758.

Isobutylbenzoylecgonine hydrochloride,

Isobutylbutylene, 592.

Isobutylene bromide, behaviour of sodiophenylmercaptide with, 962.

- mercaptan, 950.

Isobutylenebenzidine, 1299. Isobutylformanilide, 758.

Isobutylglyoxalinedicarboxylic acid,

Isobutylidenediethylsulphone, 56. Isobutylisophthalic acid, 1284.

Isobutylitaconic acid, 591, 874.

Isobutylitamalic acid, salts of, 591. - acids, α- and β-, salts of, 592, 593.

Isobutylmetaxylene, trinitro-, 1402.

Isobutylparaconic acid, 590. Isobutylphthalimide, 890.

Isobutyltoluene, trinitrometa., 1401.

Isobutyric acid, electrolysis of, 1236. Isobutyrylphenetoïl, 964.

Isochloralimide, 1093.

Isocholesterin, reaction for, 1474.

Isochrysenic acid, 1313.

Isocinnamic acid, 494, 620, 1417.

- occurrence of, in the alkaloïds of cocaïne, 494.

chloride, 1418.

Isocitric acid, 587. Isoctolactone, 591.

Isoctylenic acid, 591.

Isoctylic acid, γ-bromo-, 591.

Isocuminaldoxime, 1263.

Isodibenzoylcinnamene, Trans., 707. Isodibutylene, heat of combustion of,

Isodurylamide, \$\beta\$-, 158.

Isodurylanilide, β-, 759.

Isoeuxanthone, constitution of, 53.

Isoeuxanthone,  $\beta$ -, 506.

Isoformanilide, iodo-, 1414.

Isoheptolactone, 590. Isoheptylenic acid, 590.

- γ-bromo-, 590. Isohyposantonin, 905.

Isolapachone, 1310.

Isolepiden, reduction of, Trans., 691.

Isomeric organic substances, antiseptic powers of, Trans., 636. Isomerides, heat of combustion of, 680. Isomerism, dynamical, 1098. geometrical, 719. Isomethyleugenol dibromide, 967. Isomorphism of silver nitrate with the alkali nitrates, 328. of the chlorates of silver and the alkali metals, 1208. Isomorphous mixtures, freezing point of, 1209.Isomuconic acid, TRANS., 373. Isonaphthylrosinduline, 910. Isonononylenic acids, 592. Isoparatolylrosinduline, 909. Isophorone, 1235. Isophthalenediamidoxime, 147. Isophthalic acid, 4: 6-dichloro-, 1106. — iodo-, 1107. - --- trichloro-, 1106. Isopropyl phenyloxamate, 236. Isopropylacetanilide, 758. Isopropylaniline, 758. Isopropylcoumarin, thio-a-, 624. Isopropylcoumaroxime, a., 624. Isopropylcoumarphenylhydrazide, α-, Isopropylformanilide, 758. Isopropylisophthalic acid, 1283. Isopropylitamalic acid, salts of, 590. Isopropylmetaxylene, 1249. Isopropylmetaxylenesulphanilide, 1249. Isopropylmetaxylenesulphonamide, Isopropylmetaxylenesulphonic acid, Isopropylparaconic acid, 589. Isopyromucic acid, identity of, with pyromucic acid, 1242. Isosuccinic acid, brom-, action of alcoholic potash on, 1238. - heat of dissolution of, 320. Isostilbene, derivatives of, 783. Isotributylene, heat of combustion of, Iso-xylalphthalide, 625. Iso-xylalphthalimidine, 625. Isoxylepidenic acid, Thans., 690. Iso-xylylanilide, 759. Itaconanilic acid, 368. Itamalic acid, trichlor-, salts of, 586.

## J.

Jacobsite from Örebrö, 1076.
Jadeite, 716.
Jarosite from Utah, 573.
Jequirity, physiological action of the active principle of, 398.

Johnstrupite, 1078.
Joints, vacuum, Trans., 958.
Juniper, oil of, 902.
Jute-fibres, discrimination of, from flax and hemp, 928.

#### K.

Kaliborite, 341. Kaolins, composition of, 1060. Karyocerite, 1079. Ketoaldehydes, 357. Ketoaldehydes, α., 51. Ketodihydroquinazolylbenzoic acid, para-, 73. Ketohydronaphthalene-a-oxime, trichloro-β-, 1148. Ketone-molecules, introduction of acid radicles into, 26. Ketones, action of ammonium formate on, 783. aromatic alkyl and their oxidation, 769, 979. - oxidation of, 237, 1416. - synthesis of, from phenol ethers by Friedel and Crafft's method, 962. — thio-derivatives of, 26. - unsymmetrical, isomeric oximes of, 1263. Ketones, 1:2-, reduction products of, 1234. Ketonic acids, analogy of, to sulphonecarboxylic acids, 781. condensation of, with dicarboxylic acids, 1102. Ketonic acids,  $\beta$ -, preparation of alkyl salts of, 235. Ketonic acids, γ-, 1099. constitution of, 863. Ketopentene, hexachloro-, 754. - γγ-hexachloro-, 1255. - pentachlorobromo-, 1256. Ketotrihydroxypentamethylenecarboxylic acid, tetrachloro-, 130. Kidney-cells, proteïds of, 1015. Kidney-disease, nature of the effusions in, İ174. Kirschwasser, analyses of, 1195. Kjeldahl's method for the estimation of nitric and total nitrogen, 1466. Kobellite from Colorado, 218. Kornerupine from Fiskernás, Greenland, 19. Kynurin, 174.

### L.

Lactalbumin, estimation of, in condensed milk, 92.

Lead oxide raffinose, 580.

Lactam formation in the fatty series, Lactarius piperatus, constituents of, Lactic acid, changes in, in the muscle during work, 185. - detection and estimation of, in wines, 1345. - formation of, from ratinose and from cane-sugar, 582. - acids, chloro-, decomposition products of the sodium salts of, 1097. Lactoisocitric acid, 587. Lactones, 583. - action of ammonia on, 879. - action of sodium and sodium ethoxide on, 866. — derived from glycines, 245. Lactonic acids, 583. action of sodium and sodium ethoxide on the ethereal salts of, 866. Lactose in urine, 188. ---- physiological rôle of, 186. — properties of, 22. Lævoatropine, 75. Lævotropic acid, 74. Lansfordite, 571. Lanthana, action of magnesium on, 693. Lanthanum oxide, 852. Lapachic acid, derivatives of, 1310. \_\_\_ oxime of, 1310. Lupachoneoxime, 1310. Lard, detection of cotton seed-oil and beef stearin in, 428. - estimation of cotton-seed oil in. examination of, for adulteration, Laurenes, 1248. Laurone, preparation of, TRANS., 981. Lauroneoxime, TRANS., 983. Lavas, recent Vesuvian, 573. Lead acetate, decahydrated, 862. - antimonate, 216. ---- chloride, influence of hydrogen chloride on the solubility of, 109. — chromate, combustion with, 926. —— chromates, double, 1065. — copper and tin, alloy of, 335. - effect of, on the freezing point of tin, TRANS., 381. --- electrolytic crystallisation and dimorphism of, 437. electrolytic estimation of, 295. - estimation of, in tin, 665. - native, from Pajsberg, Sweden, 111, 337. — nitrophosphite, 945.

— oxides, 699. - peroxide, influence of, on the decomposition of potassium chlorate, TRANS., 279. - phosphates, 1056. --- phosphites, 945. --- pyrophosphite, 945. - separation of bismuth from, 421. - sodium thiosulphate, 12, 700. — sulphide, precipitated, composition of, 1217. - tetrachloride, 699. ---- thiosulphate, 700. decomposition of, by heat, 700. — tin and zinc, alloys of, 336. — trithionate, 700. Lead-works, Mechernich, crystalline sulphides from 338. Leaves, carrotene in, 285. estimation of chlorophyll in, 672. Lecithin in red blood corpuscles, 1017. Lecture experiment: Action of the electric arc on gases, 1047. - -- Conversion of carbonic anhydride into carbonic oxide, 1048. - Conversion of oxygen into carbonic oxide, 1048. --- Conversion of steam into water gas, 1049. - Conversion of sulphurous anhydride into carbonic oxide, 1049. - Formation and decomposition of sulphurous anhydride, 1049. - The demonstration of valency, 1050. Legumes, soluble carbohydrates in the seeds of, 917. Leguminosæ, cultivation of, 660. - fixation of free nitrogen by, 79, 814, 816. — root tubercles of, 660. --- the fungus symbiosis of the, 1020. Lemon juice, estimation of citric acid in, 88. - oil, crystalline deposit from, TRANS., 327. Lepiden, Zinin's, constitution of. TRANS., 662. Lepidine, chloro- and bromo-, 1322. --- ortho-(?)-nitro-, 1435. ---- paramido-, 1435. --- substitution products of, 1434. Lepidine-derivatives, formation of, from chinine and cinchine, 1433. Lepidineparasulphonic acid, 1434. Leucine, heats of combustion and formation of, 936. Leucite, formation of, 1080. Leucitophyre from Persia, 220. Leucodextrin, 998.

Leucophane, 1079.

Levulinic phenylhydrazide, hydrazone

Levulosazone, 582.

Levulose, preparation of, 1087.

synthesis of, 466.

Levulosecarboxylic acid, preparation of,

Lichenstearic acid, preparation of, 600. Lignic acids, 228.

Lignin of pine wood, 228.

- quantitative reaction for, 1474.

Light, action of chlorine on water in, Trans., 613.

- action of, on chloric acid, TRANS., 624.

- action of, on ether, in presence of oxygen and water, TRANS., 574, 988, Proc., 1889, 134.

- action of, on hypochlorous acid, TRANS., 622.

- action of, on moist oxygen, Proc., 1889, 134.

action of, on phosphorus, Trans.,

 action of, on silver chloride, 213. - action of, on the acetic fermentation, 1181.

- and air, alteration of compounds of the benzene series when exposed to,

- concentration of the sun's rays for chemical reactions, 1033.

monochromatic, production of,

- rate of decomposition of chlorine water by, 849.

Lime, gas-, estimation of ferrocyanide in, 87.

- in tanning materials, 312.

Lime-raffinose, 580.

Limestones from the "Montagnola Senese," 712. Limettin, Trans., 323.

Limonetrol, 1314.

Linoleic acid, 362.

--- examination of commercial oleïn for, 306.

Linseed oil, adulteration of, 1198.

Liquation of gold and platinum alloys,

Liquids, increase of chemical energy at the free surface of, 328.

- influence of capillarity and diffusion on the solvent action of, 555.

- mixed, composition of the vapour of, 554.

- relation of volume, pressure, and temperature in the case of, 321.

- viscosity of, 441. Lithium arsenate, normal, crystalline,

preparation of, 10.

Lithium carbonate, detection of sodium in, 547.

- lead chromates, 1065.

- malonates, and their heats of formation, 1396.

 molecular refraction of the halogen salts of, 549.

 molybdate, rotatory power of compounds of malic acid with, 744.

oxide, reduction of, by magnesium,

331. phosphate, normal crystalline, preparation of, 10.

- phosphates, 1055.

Litmus, action of acids on, 792.

Liver, diastatic ferment of, 185.

- disease, nature of the effusions in, 1174.

— glycogen in the, 1334.

- normal storage of iron in the, 1177.

 of young animals, quantity of iron in, 185.

Liver-cells, proteïds of, 1014.

Lobeline, 1169.

Logwood extract, action of chlorine on,

Lupins, fixation of free nitrogen by,

Lupinus luteus, non-nitrogenous reserve substance of the seeds of, 284.

Lupulin, 657.

- estimation of, in hops, 431. Lussatite, a new form of silica, 569.

Lutecite, 712.

Lutidine, a new, 1002. Lutidylalkine, 1447.

#### M.

Mace oil, 1150.

Magnesia-mica, artificial, 343.

Magnesia-knebelite from Dalecarlia.

Magnesium ammonium thiosulphate,

– as a reagent, 195.

— atomic weight of, 850.

--- boride, 693.

--- burnt, ammonia in, 1209.

— chromiodate, 1378.
— effect of, on the freezing point of tin, TRANS., 381.

— molybdate, rotatory power of com-pounds of malic acid with, 744.

-- nitride, formation of, 451.

— oxide, crystalline, 850.

potassium arsenates, 562.

--- thiosulphate, 564.

- presence of, in calcium and sodium phosphates, 664.

Magnesium, reduction of oxygen com-Manganese peroxide, titration of, in pounds by, 331, 451, 693, 1372. Weldon muds, 548. - silicates, action of sea water on, 451. - phosphorescence of, in the sulph-— silicide, 1372. ides of the alkaline earth metals, 201. ---- sodium arsenates, 563. potassium arsenates, 563. Magnetic field, influence of, on the elec-- precipitation of, as peroxide, 419. trical resistance of gases, 1359. ---- preparation of, 110. - rotation of phosphorous oxide, —— sodium arsenates, 563. TRANS., 567. Magnetism of salts of metals of the iron group, effect of temperature on the, - tetrachloride, PRoc., 1890, 58. 678.Magnets iron, electrochemical effects ---- thiosulphate, 12, 564. with, 678. volumetric estimation of, 1470. Maize in the experimental plots at Maganiferous spring waters, 854. Grignon in 1889, 820. Manganous acid, 1060. Malachite, artificial formation of, 454. Mannitol, behaviour of, towards boric Maleamic acid, dichloro-, 25. acid, 1357. Maleïc acid and fumaric acid, isomerism fermentation of, 915.hexachlorohydrin, 1388. of, 363. · conversion of, into fumaric Mannitol, i-, 469. acid, 1397. Mannitol, 1-, 467. - anhydride, heat of hydration of, Mannitol-series, relation of the carbo-680. hydrates of, to a-acrose, 470. Maleimide, chloramido-, 25. Mannoctitol, d-, 1233. --- dichloro-, derivatives of, 24. Mannoctolactone, 598, 1232. Malic acid, combination of, with normal Mannoctonic acid, 598. potassium and sodium tungstates, Mannoctose, 598  $\bar{1}102.$ Mannoctose, d-, 1232. estimation of, in wine, 427.

rotatory power of compounds of, with normal lithium and mag-Mannoheptitol, 598. Mannoheptonic acid, d-, 1230. Mannoheptosazone, d-, 1232. Mannoheptose, 598 nesium molybdates, 744. -- α-dinaphthalide, 1163. Mannoheptose, d-, 1230. - hydrazone of, 1231. —— diorthotoluidide, 1163. —— diparatoluidide, 1163. Mannonic acid and its derivatives. ----- β-naphthalide, 1163. — orthotoluidide, 1163. Mannonic acid, i-, 467. Malonic acid, action of orthonitrocinnam-Mannonic lactone, d-, 1233. aldehyde on, 163. Mannonose, d-, 1233. - — phenylhydrazide, 155. Mannose, 224. Malonylphenylhydrazine, 155. — acetochloro-, 226. Malt, extract of, diastatic power of, 432. — synthesis of, 466. Maltase, 998. Mannose, d-, sugars richer in carbon Maltose, molecular weight of, 227. from, 1230. Mammals, origin of uric acid in, 184. Mannose, i-, 468. Manganese antimonate, 216. Mannose, 1-, 466. —– arsenate, 563. Mannosecarboxylic acid phenylhydr-- electrolytic estimation of, 294, 1029. azide, 154. ---- estimation of, in soils, 833. Mannosediphenylhydrazone, 1260. —— ores from Dillenburg, 459. Mannosephenylglucosazone, i-, 468. Mannosephenylglucosazone, 1-, 466. - oxides, 570. Mannosephenylhydrazone, i-, 468. — action of hydrogen peroxide on, 946. Mannosephenylhydrazone, 1-. 466. peroxide, action of hydrochloric Manure, farmyard, analysis of, 1478. acid on, Proc., 1890, 58. experiments with, 411. - fermentation of, in absence of ---- constitution of, 566.
---- influence of, on the decomoxygen, 282. position of potassium chlorate, TRANS., Manures, estimation of the total nitro-277. gen in, 921. gas-volumetric estimation of, - green, as suppliers of nitrogen. 1184. 1470.

Manures, organic, decomposition of, in soils, 1183.

phosphatic, estimation of ferric oxide and alumina in, 420.

Manuring, effect of, with ammonium sulphate and sodium nitrate, 287. Marsh gas fermentation, 855.

Marrow, bone-fat of, 652.

- cattle, 1172.

Massoy bark oil, 638. Massoyene, 638, 1316.

Matezite, 471.

rotatory power of, 471.

Matezodambose, 471. - rotatory power of, 471.

Mazapilite from North America, 218. Medullic acid, 652.

Melamine, formation of, 1082.

Melanin, 805.

Melanins, animal, 1452.

Melezitose, 733.

Melibiose, 227, 1084.

Melibiosephenylhydrazine, 1085.

Melibiotite, 227.

Melinophane, 1079.

Melitose, 356.

Melitriose, 226, 1085.

Melting point of organic substances, exact determination of, 1.

---- points, determination of, 939.

 new apparatus for estimating, 939.

 of organic compounds, 1204. Membranes, living and dead, osmosis with, 207, 277.

Menthol, action of carbon bisulphide on,

Menthylxanthic acid, 517.

Mercaptans, aromatic, 603.

Mercaptomethylthiazoline,  $\mu\beta$ -, 860.

Mer aptopenthiazoline,  $\mu$ -, 473, 1090.

Mercurammonium bromide, 1212. -- compounds, reaction for, 1211.

cyanides, 223.

Mercuranisoil oxide, 1270.

- salts, 1270.

Mercuricobaltammonium salts, 13, 1377.

Mercurobenzaniide, 1123.

Mercurodianisoïl, para-, 1269.

Mercurodimethylaniline salts, 1269.

Mercurous salts, action of sulphur on,

Mercury, action of the haloïd compounds of the alkalis on those of, 1059.

- and zinc, double cyanides of, 855. - interaction of the haloïd salts

of, 224.

— blowpipe test for, 1343.

- compounds, aromatic, 1269.

- cvanide, action of ammonia on the compounds of, with metallic chlorides, 351.

Mercury cyanide, action of cupric salts

- detection of, in toxicological investigations, 198.

— detection of, in organic liquids, 926. - effect of, on the freezing point of tin, Trans., 383.

electrolytic estimation of, 294.

 electrolytic separation of from arsenic, molybdenum, palladium, and tungsten, 1029.

electrolytic separation of, from cobalt, nickel, and zinc, 664.

estimation of, 565.

--- hydrosulphide, Proc., 1890, 51.

 new ammoniacal compounds of, 1211.

occurrence of, in tapeworms, 396.

oxide, action of magnesium on, 452.

- influence of, on the decomposition of potassium chlorate, Trans., 279.

oxychloride, crystalline, 565.

-— oxysulphides, 109.

- polarised, surface tension of, in different electrolytes, 552, 1036.

· salts, compounds of, pyridine with, 643.

 sensitive test for impurities in, 827.

 solid, electrical conductivity of, 98.

· sulphates from a furnace at Idria, 710.

Mercury-acetamide, action of iodine on,

Mercury-benzamide, action of iodine on,

Mesaconanilic acid, 368.

Mesaconic acid, synthesis of, from ethyl propenyltricarboxylate, 1101.

Mesitylglyoxylic acid, 981.

Mesityl methyl ketone, 981.

Mesityloyrroline, 999.

Mesoanthramine, 1426.

hydride, 1426.

Messelite, 218.

Metabolism, animal, behaviour of tyrosine ethyl ether in, 187.

Metal, films of vaporised, 692.

Metallic precipitates, crystalline, 851.

Metalloquinolides, 643.

Metals, determination of the molecular weights of, 1046.

molecular weight of, in solution, Trans., 376, 656.

Metamorphism produced by pressure, Trans., 410.

Metapropaldehyde, 955.

Methæmoglobin, 1012.

Meteoric iron from East Tennessee, 115

Meteoric iron from Magura, Hungary, - from North Carolina, 1081. Meteorite from Carcote, Chili, 347, from Mexico, 346. from Mighei, Russia, 346. --- from Phu-Hong, 222. — new stone, 574. --- of Alfianello, 115. — of Concepcion, 115. Methenylanilidoxime, 44. Methose, molecular weight of, 466. Methoxycinnamic acid, orthonitrometa-, Methoxydihydroxydihydroquinoline, para-, 1127. Methoxyhydrocotarnine methiodide, Methoxyl, estimation of, 299. Methoxylepidine, para-, 1433. Methoxymethylparaphenylenediamine, Methoxyphenyl-β-bromopropionic acid, orthonitrometa-, 1127. Methoxyphenyllactamide, orthonitrometa-, 1128. Methoxyphenyllactic acid, orthonitrometa-, 1127. Methoxyquinoline-hydroxyquinoline methiodide, 174. Methoxyquinonedioxime, 608. Methyl alcohol, estimation of acetone in, 837. — amidocumate (meta-), 269. — anhydroberberilate, Trans., 1039. - anisate, thermochemistry of, 101. —  $\beta$ -bromhydromuconate, 876. bromundecylenate, 1237. chloracetamidocumate, (meta-), 270. - chloranilate, 136. -  $\omega$ -chlorethylpiperonylcarboxylate, TRANS., 1032. - β-chloroquartenylate, 865. — chloroxalate, 236. – cineolate, 1314. cinnamate, thermochemistry of, citrate, thermochemistry of, 101. — diacetoxypyromellitate, 984. - diamidopyromellitate, 987. - diazoacetate, action of, on the ethereal salts of unsaturated acids, 736.- dicyanacetate, 1395. dihydrodiacetoxypyromellitate, · dihydrodihydroxypyromellitate, 987. Δ<sup>1:3</sup> dihydroterephthalate dibromide and dihydrobromide, 1132. VOL. LYIII.

Methyl Aq: 5 cistrans dihydroterephthalate di- and tetra-bromides, 1131. Δ<sup>1 4</sup> dihydroterephthalate tetrabromide, 1132. – dihydroxypyromellitate, 987. diketohexamethylenetetracarboxylate (para-), 987. — dimethoxypyromellitate, 985. dinitropyromellitate, 987. dinitropyrrolinecarboxylate, 66. - diparatoluyl tricyanide, 1253. diphenyl tricyanide, preparation of, 1252.— β-ethoxyquartenylate, 865. - ethylacetoacetate, action of ammonia on, 1097. - fluoride, hydrate of, 1386. fumarate, thermochemistry of, 101. --- furfuracrylate, 959. — gallate, thermochemistry of, 101. - hexamethylenecarboxylate, 737. - hydroxybenzoate (para-), thermochemistry of, 101. imidomethylphenylthiocarbamate, - imidophenylthiocarbamate, 1291. --- β-isobutoxyquartenylate, 865. - isophthalate, thermochemistry of, mellitate, thermochemistry of, 101. - mercaptan in human intestinal gases, 540. - eta-methoxyquartenylate, 865. - methylimidomethylphenylthiocarbamate, 1291. - methylphenyldithioearbamate, methylphenylthiocarbamate, 1291.  $---\beta$ -naphthoate, thermochemistry of, 101. --- nitrocumate, meta-, 269. — nitropyrroline-a-carboxylates, 66. —— orthocyanobenzyl sulphide, 1250. — oxalacetate phenylhydrazone, 156. --- oxalate, thermochemistry of, 101. — paratolyl ketone, nitroso-, 52. — phenylimidomethylphenylthiocarbamate, 1291. – phenyloxamate, 235. — phenylthiocarbamate, 1291. — phosphite, 859. --- phthalate, thermochemistry 101. —  $\beta$ -propoxyquartenylate, 865. α-pyrrolinecarboxylate, molecular weight of, 896. – quinonepyromellitate, 987. --- succinate, thermochemistry 101. terephthalate, thermochemistry of,

Δ¹ tetrahydrophthalate, 1281.

```
Methyl A2 cistrans tetrahydroterephthal-
                                             Methyldiethylthiocarbamide, 1241.
                                             Methyldihydrometanaphthaquinone,
  ate dibromides, 1133.
    - trimesate, thermochemistry of, 101.
    - trimethylenetetracarboxylate, 1398.
                                             Methyldihydropentene methyl ketone,
— undecylenate, 1237.
Methylacetanilide, 758.
                                               Trans., 232, 242.
                                                      - - pinacone of, Trans., 248.
     action of zinc chloride on, 1112.
                                             Methyldihydropentenedicarboxylic acid,
Methylacetoacetamide, 1097.
                                               TRANS., 233.
Methylallythiocarbamide, 477.
                                                     - action of bromine on, TRANS.,
Methylamidomethylsuccinamicacid, 870.
                                               234.
Methylamidosuccinamic acid, 871.
                                                    --- action of hydrobromic acid
                                               on, Trans., 235.
Methylanilidomaleic acid phenylimide,
                                             Methyldihydropentenemethylketoneox-
                                               ime, Trans., 236.
Methylaniline, 758.
    - orthonitro-, 612.
                                             Methyldihydroquinazoline, \beta-, 1443.
                                             Methyldiphenylamine, paranitroso-, 614.
    - orthonitronitroso-, 612.
Methylanilines, analysis of, 309.
                                             Methyldiphenylene ketone oxide, 901.
     examination of, 430.
                                             Methyldiphenylmetadiazine, amido-, 68.
Methylanisaldoxime, 1261.
                                                       formation of, 1159.
                                             Methyl-3-diphenyl-5-phenylpyrrolidone, [1-], Trans., 701.
Methylanthracene, β-, 511.
Methylanthraquinone, \beta-, 511.
Methylasparagine, 871.
                                             Methyl-3-diphenyl-5-phenylpyrrolone,
Methylaspartic acid, 871.
                                                [1-], Trans., 698.
                                             Methyldiphenylsulphone phenyl sulph-
      dimethylamide, 870.
Methylazophenine, 610.
                                               ide, 988.
Methylbenzile, para-, 168.
                                             Methylecgonine, 647, 913.
Methylbenzoic acid, 4:6-dichloro-3-,
                                             Methylene chloride, action of benzyl-
   1106.
                                               amine on, 887.
      sulphinde, 382.
                                                 - fluoride, 1053.
Methylbenzylacetone, ortho-, 1138.
                                                 - iodide, reaction of aniline with, 1164.
Methylbenzylanilinesulphonic acid, so-
                                             Methylenedibenzylamine, 887.
                                             Methylenedi-$\beta$-naphthyl oxide, 511.
   dium salt of, 611.
                                             Methylenediorthotoluidine, 888.
Methylbenzylsulphideorthocarboxylic
   acid, 1251.
                                             Methylenediparatoluidine, 887.
                                             Methylenedi-phenylmethylpyrazolone,
Methylbromacetamidocumate, bromo-,
                                                646.
Methylbromothymol, 366.
                                             Methylenediphthalimide, 890.
Methylbutylphenylacetic acid, 388.
                                             Methylenedipiperidine, 955, 1092.
 Methylcarboxyphenylacetic acid, 389.
                                             Methylenephthalyl, dichloro-, 786.
 Methyl-β-chlorocrotonic acids, α-, 958.
                                                  tetrachloro-, 786.
                                             Methyl-2'-ethylcinchoninic acid, [3-],
 Methylchloropiaselenole, 973.
 Methylcinchoninic acid, [3'], 1325.
                                                1326.
                                             Methylethylene glycol, \delta-, oxidation of, 1222.
 Methylcinnamic acid, metachloro-α-,
   1139.
        --- metamido-ortho-, 1140.
                                             Methylethylhexamethylene,
                                                                            ortho-.
                                             Trans., 25.
Methylethylhexamethylene, of, Trans., 13.
   — — metanitro-α-, 1140.
  — ortho-, 969.
— para-, 969, 1140.
                                                                            synthesis
                                             Methylethylketol, 1235.
 Methyleitraconic acid, 585.
                                             Methylethylnitrouracil, 32.
 Methylcocaïne, 647, 803, 913, 1011.
 Methylconmarin, thio-α-, 624.
                                             Methylethylpentamethylene,
                                                                            TRANS.,
 Methylcoumaroxime, α-, 624.
      acetate, a-, 624.
                                             Methylethylphenylpyrazole, 358.
                                             Methylethylpyridylalkine, 1436.
 Methylcoumarphenylhydrazide, a., 624.
 Methylcuminaldoxime, 1262.
                                             Methylethylsuccinic acids, symmetrical,
 Methyldehydropentone, Proc., 1890,
                                                741.
                                             Methylethylthiazole, 1238.
 Methyldehydropentonecarboxylic acid,
                                             Methylformanilide, 758.
   Proc., 1890, 138.
                                             Methylfurfuraldehyde, 33.
 Methyldeoxybenzoïncarboxylamide, 625.
                                             Methylfurfurine, 1105.
Methyldeoxybenzoïnorthocarboxylic
                                             Methylheptonic acid, 599.
   acid, meta-, 625.

    lactone, 599.
```

Methylheptose, 599. Methylhexamethylenemethylcarbinol, TRANS., 21. Methylhexamethylenemethylcarbinyl acetate, Trans., 22. Methylhexose, 599. Methylhexylitamalic acids, a- and  $\beta$ -, salts of, 593, 594. Methylhexylparaconic acids,  $\alpha$ - and  $\beta$ -, 593, 594. Methylhydrasteine, 533. Methylhydrastine, 532, 1167. - alcoholate, 1168. - hydroxide, 1168. - methiodide, 533, 1168. Methylhydrazine, 23. action of, on dialdehydes and diketones, 24. Methylhydrindone,  $\beta$ -, 1139. – meta-, 1140. - para-, 1140. Methylhydrindonephenylhydrazone,  $\beta$ -, 1139. Methylhydroberberine, 920, 1012. Methylhydrocinnamaldehyde,  $\alpha$ -, 979. para-, 979. Methylhydrocinnamic acid, para-, 969. Methylhydroxybutyric acid, a-chloro-a-, Methyl- $\delta$ -hydroxyquinazoline,  $\beta$ -, nitro-, and chloro-, 802. Methylhydroxysulphonebetaïne, 522. Methylhydroxyxanthine, 32. Methylindene,  $\gamma$ -, 1138. Methyl-a-iodoethylpentamethylene, TRANS., 249. Methylisoanisaldoxime, 1261. Methylisobarbiturie acid, 32. Methylisobutylparaconic acids,  $\alpha$ - and  $\beta$ -, **592**. Methylisoformanilide, 1258, 1414. Methylitaconic acid, 586. Methylitamalic acid, salts of, 585. Methylketole, dinitro-, 897. Methyllevulindioxime,  $\alpha$ -, 1155. Methylmercaptomethylthiazoline, 860. Methylmetachlorhydrindone, β-, 1140. Methylmetachlorophenylpropionic acid, αβ-, 1140. Methylmetamidophenylpropionic acid, α-β-, 1140. Methylmetanitroisobenzaldoxime, 1262. Methylmethylenegallic acid, 530. Methylmethylenegallocarboxylic acid, Methylmethylenetribromopyrogallol, Methylmethylenetrihydroxyphthalic acid, 530.

Methylnaphthol, 775.

Methylnitrouracil, 32.

Methyl- $\alpha$ -naphthol,  $\beta$ -, 776.

Methylnonylphenylhydrazone, 1394. Methylorthamidobenzenylamidoxime, para-, 47. Methylorthanisidine, 607. paranitroso-, 607. Methylorthanisidylnitrosamine, 607. Methylorthomethoxybenzanilide, meta-, Methylorthonitrobenzamide, para-, 47. Methylorthonitrobenzenylamidoxime, para-, **47.** Methylorthonitrobenzonitrile, para-, 47. Methylparaconic acid, 584. - dichloro-, 587. - trichloro-, 586. Methylparamethoxybenzanilide, meta-, 760. Methylparatolylsulphone, bromo-, dibromo-, and dichloro-, 381. Methylparaxylidine, 606. Methylpentamethylenemethylcarbinol, TRANS., 245. Methylpentamethylenemethylcarbinyl acetate, Trans., 249. · iodide, Trans., 249. Methylphenotetrazine, α-, 613. Methylphenylacetylindole, [1':2':3'-], Methyl-3-phenyldiliydroquinazolone, [2], 1443.Methylphenylhydrazine, derivatives of, 1259.Methylphenylindole, [1':3'-], 57. Methylphenylisocrotonic acid,  $\alpha$ -, 665. Methylphenylisocrotonic acid,  $\beta$ -, 776. Methylphenylitamalic acid,  $\beta$ -, salts of 776. Methylphenyloxazoline,  $\beta\mu$ -, 1267. Methylphenylparaconic acid, a-, 775. Methylphenylparaconic acid, β, 776. Methyl-4-phenylpyrrodiazolone, [2-], 889. Methylphenylsemithiocarbazide, Trans., 261. Methylphenylsulphone, bromo-, and dibromo-, 381. chloro-, 380. dichloro-, 381. Methylphenylthiosemicarbazide, 23, Methylphthalide, tetrachloro-, 786. Methylpiazothiole, 161. Methylpicrazide, 23. Methylpipecolylalkine, a-, 68. Methylpiperidine bases, β-, 1003. Methylpropargylamine, 230. Methylpropylene- $\psi$ -thiocarbamide, 760. Methylpropylglutaric acids, symmetrical, Methylpropylmethoxybenzanilide, 760. Methylpropylmethoxybenzoic acid, 760. Methyl-β-pyrazole - 4 : 5 - dicarboxylic

acid, [2], 1439.

Methylpyridinedicarboxylic acid, 1002. Methylpyromucic acid, 601. Methylpyrrolidonecarboxylamide,  $\lceil 2 \rceil$ , Methylpyrrolketonedicarboxylic acid, tertiary, 1431. Methylpyrrylglyoxylic acid, 1-, constitution of, 389. Methylquinol, dinitro-, 752. Methylquinoline, 1322. Methylrosindone, 909. "Methylsaccharin," 382. Methylsalicenylamidoxime, 146. Methylsalicenylbenzenylazoxime, 146. Methylsalicylonitrile, properties of, 146. Methylsemicarbazide, 23. Methylsuccinamic dimethylamide, 870. Methylsuccinic acid, 742. Methylstrychnine, 1447. Methyltarconic acid, 532. Methyltaurine, β-, 128. Methyltaurocarbamic acid,  $\beta$ -, 128. Methyltetrahydrobenzene methyl ketone, ortho-, Trans., 16. Methyltetrahydrobenzenemethylcarbinol, Trans., 24. Methyltetrahydrodibutylphenanthro-Methylthiocarbamideallyl cyanide, 1104. Methylthiocarbamidebenzyl cyanide, Methylthiocarbamidemethyl cvanide, Methylthiocarbamidepropyl cyanide, Methylthio-β-dinaphthylamine, 1306. Methylthiophenyl -  $\beta$  - naphthylamine, 1307. Methylthiophthalimidine, 1250. Methyl-3-toluquinoline, [4'-], 1325. Methyltolylsulphone, chloro-, 380. Methyltribromopyrrylglyoxylic acid. [1-], 390.
Methyltriphenylbromopyrrolone, crystallography of, TRANS., 728. Methyltriphenylpyrrolone, action ofbromine on, TRANS., 699. crystallography of, Trans., 724. - oxidation of, Trans., 701. Methyluracil, alkyl derivatives of, 31. diiodide, 32. Methylxylidine, paranitroso-, 913. paranitrosopara-, 607. Methylxylylenediamine, 607. Methylxylylnitrosamine, para-, 607. Methysticin, 257. Methysticinic acid, 257. Methysticol, 257. Mica, action of solutions of alkalis, alkaline earths, and certain salts on, 1080.

Mica, analysis of, 220. Mica-group, theory of, 460. Michel-levite, 572. Micrococcus ocidi paralactici, 79. Micro-organisms, reducing power of, 1453. - reduction of nitrates by, 1453. Milk, abnormal, TRANS., 201. — adulteration of, 428. - analysis, 670, 929. — boiled, digestibility of, 650. - changes in, by udder tuberculosis, 652. - condensed, estimation of casein and lactalbumin in, 92. — cow's, amount of nitrogen in, 652. - estimation of the principal constituents of, 1472. - estimation of fat in, 837. - in dairies, estimation of fat in, 1346. - influence of salts on the clotting of, 1176. of the bottle-nosed whale, 812. of the gamoose, Trans., 754. - rapid estimation of fat in, 304. - sour, estimation of fat in, 304. - volumetric, estimation of fat in, 92. Milk-Lolids, extraction of fat from, 91. Milk-sugar, carboxylic acid of, 599. Mineral waters of Cransac, 1385. - --- of Malaisie, 1081. Mineralogical-chemical theories, 219. Minerals from the French Creek mines, - from the Tyrol, 339. - of the syenite-pegmatite veins of the South Norwegian augite and nepheline-syenites, 1077. solubility of, 1070. Minium from Leadville, 570. Molasses, extraction of raffinose from, lactic acid in, 583. Molecular and atomic urion, can Raoult's method distinguish between, constitution of compounds at their critical points, 443. - — of isomeric solutions, 207. forces, sphere of action of, 105. refraction, 1. - of the halogen salts of lithium, sodium, and potassium, 549. - theory of a substance formed from

two different components, 556.

- of aromatic compounds, 683.

- - of organic compounds, for-

--- volumes, law of, 1043.

mulæ for calculating, 323.

Molecular weight, determination of, from the reduction of vapour pressure, 323. - determinations of solid substances, 1044. - - of dissolved iodine, phosphorus, and sulphur, 447. – —— of hydrogen peroxide, 106. — of ζ-invertan, Trans., 911. - - of metals in solution, Trans., 376, 656. of nitrous anhydride, Trans., 595. of phosphorous oxide, Trans., 551. of pyrroline-derivatives, 906. weights, cryoscopic method of determining 324. determination of, by Raoult's method, Trans., 804. - new principles of determining, of cholic acid, cholesterin, and hydrobilirubin, 914. - --- of hæmatoporphyrin and bilirubin, 76. - of maltose, and of several inulin-like substances, 227. - of metals, determination of, 1046. - of organic compounds, determinations of, by Raoult's method, - of substances, determination of, from the boiling points of their solutions, 104. - -- of the colloïdal modifications of tungstic, silicic, and molybdic acids, of ferric hydroxide, &c., 1215. - - of the imidoanhydrides of pyrrolinecarboxylic and indolecarboxylic acids, 67. Molina cærulea, from Konigsberg, near Raibl, analysis of, 658. Molybdenum, fluoroxy-salts of, 702. Molybdic acid, colloïdal, molecular weight of, 1215. Molybdiodic acid, 107. Monazite from Quebec, 457. - from Ural, 571. Moorland soil, examination of, 192. Moradeïne, 405. Moradin, 404. Morphine and its derivatives, physiological action of, 1178. colorimetric estimation of, opium preparations, 1349. - estimation of, 1198. estimation of, in opium, 94, 1349.

- ferrocyanide, 1318.

- reaction of, 311.

Mosandrite, 1078.

- from Papaver rheas, 646.

Motors, living, and the theory of heat, Mucic acid, Trans., 931, 937. -- aldehyde-acid from, 599. derivatives of, Teans., 370. Muconamic acid, β-dichloro-, TRANS., Muconamide, β-dichloro-, Trans., 935. Muconic acid, 877, Trans., 375. - — β-dichloro-, TRANS., 932. ---- action of reducing agents on, Trans., 936. - --- dichloro-, reduction products of, 875. Mucous fermentation, 76. Mud from the Baku mud volcanoes, - sea, of the alluvia of the Zuiderzee, 822. Multi-rotation, 1084. Muscle, changes of the glycogen, sugar, and lactic acid of the, while performing work, 185. glycogen in the, 1334. - heat of combustion of, 938. - with an artificial circulation, formation of glycogen in, 1335. Muscovite from Syra, 344. Muscular work, influence of, on the exhalation of carbonic anhydride, 1334. Musk, artificial, 1401. Mussoenda coffee, 285. Mustard oil, effect of, on animals, 539. Myohæmatin, 652. Myristic aldehyde, 1234. Myristicin, 1150. – dibromo-, 1150.

## N.

Naphtha district, the Transcaspian, 115.

Naphthalene, action of methyl chloride

amidochlorotrinitro-, 626,

Nagyágite from Nagyág, 711.

Naphthabenzein,  $\alpha$ -, 902.

Myrrh, 1317.

on, 1145.

— anilidochlorotrinitro-, 626.
— chlorides of, Proc., 1890, 85.
— action of alkalis on, Proc., 1890, 85.
— constitution of, 1301, 1304, 1424.
— constitution of tri-derivatives of, Proc., 1890, 11, 15, 16, 125, 126, 127, 128, 131.
— 1: 3-dichloro-, derivatives of, 626.
— formula of, Proc., 1890, 102.
— picrate, molecular weight of, 725.
— reduction of, 1146.

Naphthaleneazodihydroxynaphthalene, 1: 2: 2'-5-, 628.

Naphthaleneazo-β-naphthylphenylamine, a-, 993.

Naphthaleneazo-β-naphthylphenylamine,  $\beta$ -, 993.

Naphthalene-derivatives, comparative influence exerted by the radicles Cl, OH, and NH2 in, on the formation of sulphonic acids, Proc., 1890, 133.

hydrogenation of, 1299.

Naphthalenedisulphonic acid, a-amido-1-3'-, Proc., 1890, 15.

Naphthalene-1: 2'-disulphonic acid. Proc., 1890, 125.

Naphthalene-1: 3-disulphonic acid, action of potash on, Proc., 1890, 136.

Naphthalenedisulphonic acids,  $\beta$ -chloro-, Р̂кос., **1890,** 131.

Naphthalenes, dichloro-, the ten iso-meric, and the sulphonic acids and trichloronaphthalenes derived therefrom, Proc., 1890, 77.

- dinitrodichloro-, 626.

- trichloro-, homonucleal, Proc., 1890, 76.

Naphthalene-series, isomeric change in, Р́кос., **1890,** 86.

Naphthalenesulphonamide, 1: 4-, action of hydriodic acid on, 994.

Naphthalenesulphonamide, amido-, 994. Naphthalenesulphoncyanamides, α- and β-, 501.

Naphthalenesulphonic 1:1'acid, chloro-, 635.

- ---- 1 : 4-nitro-, 634. - ---- 1 : 4'-iodo-, 168.

- acids, chloro-, influence of position in determining the nature of the isomeric change in, Proc., 1890, 86.

Naphthalenetrisulphonic acid, Proc., 1890, 125.

Naphthanilide, α-, 759.

Naphthaphenanthrazine, amido- $\beta$ -, 1424. Naphthaphenazine, amido-, 509.

- a-amido-, 1266. - a-amido-a-, 801.

Naphthapiazothiole, 972.

Naphthaquinol, nitro- $\beta$ -, 509.

Naphthaquinoline-ay-dicarboxylic acid, a-, 1008.

Naphthaquinoline-ay-dicarboxylic acid,  $\beta$ -, 1009.

Naphthaquinolines, reduction products of, 1303.

Naphthaquinone, a third, TRANS., 631.

– dichloride, dichloro-α-, 786. nitro-β-, derivatives of, 509.

Naphthaquinonedianil, 911.

Naphthaquinonedioxime,  $\beta$ -, 1403. Naphthaquinone-α-oxime, chloro-β-,

— dichloro-β-, 1147.

Naphthaquinonephenazine, 1446. Naphthaquinonetolazine, a-, 1447. Naphthaquinoxaline, [1:2-], 972. Naphtharesorcinol, azo-colours from,

Naphthasulphonamidesulphonic acid, α-,

Naphthasultonsulphonic acid, ε-, 387. Naphthazine,  $\alpha\beta$ -, preparation of, 614. Naphthazine, symmetrical-ββ-, 993. Naphthenylamidethoxime,  $\beta$ -, 62.

Naphthenylamidoximes, derivatives of the two isomeric, 62.

Naphthenylbenzenylazoxime, β-, 62. Naphthenylcarbonylimidoxime, α-, 63.

Naphthenylcarbonylimidoxime,  $\beta$ -, 62. Naphtheurhodol, a., 1266.

Naphthindole,  $\beta$ -, 57.

Naphthionamide, 635. Naphthol, α-, amidothio-, 995.

-dibrom, action of nitric acid on, TRANS., 808.

preparation of, Trans., 395.

Naphthol, β-, diamido-, hydrochloride, 1424.

nitroso-, constitution of, 1424.

— trinitrochloro-, 627. Naphtholcamphorides,  $\alpha$ - and  $\beta$ -, 1427. Naphthol-ε-disulphonic acid, α-, 387.

Naphthols, action of nitrogen iodide on. 1402.

– isomeric, dichloro-, 620.

 nitroso-, action of sulphurous anhydride on, 1305.

-  $\alpha$ - and  $\beta$ -, reagents for, 927. Naphtholsulphonic acids, β-, constitution of, Proc., 1890, 11.

Naphthol-yellow, constitution of, Proc., 1890, 16.

Naphthyl methyl ketone, 52. Naphthylamidoacetic acid, 900.

Naphthylamine, dichloro-, 620.

Naphthylamine α-, β-nitroso-, 630. Naphthylamine, β-, diamido-, hydro-

chlorides, 1424.

Naphthylaminedisulphonic acid, Dahl No. II, constitution of, Proc., **1890**, 125.

— Dahl No. III, constitution of, Proc., 1890, 16.

- the Schöllkopf, constitution of, Proc., 1890, 126.

Naphthylamine-δ-disulphonic acid, Casella's  $\beta$ -, constitution of, Proc., 1890, 127,

Naphthylamine-ε-disulphonic acid, α-, 386, 388.

Naphthylamines, action of nascent nitrous acid on, 39.

Naphthylamines, β-, secondary, azo-derivatives of, 992.

Naphthylaminesulphonic acids,  $\beta$ -, constitution of, Proc., 1890, 11.

Naphthylaminesulphonic acids, the isomeric heteronucleal  $\beta$ -, the disulphonic acids obtained by sulphonating, Proc., **1890**, 128.

Naphthylazo-α-hydroxynaphthoic acid, α-, 1148.

Naphthylcarbamide, asymmetrical,  $\beta$ -, 634.

Naphthyldiphenylpyrrolines,  $\alpha$ - and  $\beta$ -, 263, 264.

Naphthylglycins, derivatives of, 1309.

Naphthylhydrazine,  $\beta$ -, 61.

naphthylthiocarbizinate, 61. Naphthylhydroxythiocarbamide, α-, 1127.

Naphthylimidodiacetic acid,  $\alpha$ -, 1309. Naphthylimidodiacetic acid,  $\beta$ -, 1309. Naphthylphenylcarbamide, amido-, 616. Naphthylphenylene ketone oxide,  $\alpha$ - and β-, 901.

Naphthylpiperidine, tertiary- $\alpha$ -, 1003. Naphthylpiperidine, tertiary-\$\beta\$-, 1003. Naphthylpropylene-ψ-thiocarbamide,

a-, 160.

Naphthylrosinduline, 910.

Naphthylsemicarbazide,  $\beta$ , 61. Naphthylthiocarbizine,  $\beta$ , 61.

Naphthylthiosemicarbazide,  $\beta$ -, 61. Narceïne ferrocyanide, 1318.

Narcotine, 528.

- constitution of, 531.

- ferrocyanide, 1318. - oxidation of, 648.

Natrolite from Monte Baldo, 114.

Natrophilite from Branchville, 1072. Neotesite, 1076.

Nepheline, formation of, 1080.

Nephrite, 716.

Neriin, 1316.

Nerium oleander, constituents of the bark of, 1316.

Nerves, temperature in, 536.

Nesquehonite, 571.

Nessler test, influence of temperature on, 1024.

Neurokeratin, 807.

Nickel, action of carbonic oxide on, TRANS., 749.

- antimonate, 216.

- anomalous rotatory dispersion in, 673.

- chromiodate, 1378.

- effect of, on the freezing point of tin, Trans., 378.

electrolytic estimation of, 294.

- electrolytic separation of cadmium, of mercury, and of silver, from, 664.

estimation of, 294, 297, 1470. estimation of, by precipitation, as sulphide, 297.

Nickel, influence of, on steel, 566.

- ore from Gosenbach, 711. - oxides, 1213.

- oxydiamine nitrite, 216.

— potassium arsenates, 563.

- salts, action of sodium carbonate and bromine on solutions of, 568.

- effect of temperature on the magnetism of, 678.

separation of zinc from, 418.

- sesquioxide, influence of, on the decomposition of potassium chlorate, Trans., 278.

silicate, hydrated, from North America, 219.

— sodium arsenates, 563. - sulphide, 21**5.** 

---- thiosulphate, 330.

Nickel-carbon-oxide, Trans., 750.

Nicotine, estimation of, in tobacco, 430. · influence of, on salivary secretion, 397.

physiological action of, 1178.

 thermochemistry of, 101. Nigella damascena, damascenine from, 1317.

Niobium, microscopical test for, 86.

- pentoxide, combinations of potassium fluoride with, 15.

Nitrates, catalytic formation of ammonia from, 689.

 colorimetric methods for estimating, in potable waters, 831, 832.

- elaboration of, in the plant, 1182. - estimation of, in water, TRANS., 811.

formation of, in plants, 543.

- formed in manured and unmanured soils, 408.

- Jodlbauer's modification of Kjeldahl's method for the estimation of nitrogen in, 292.

- molecular refraction of, 1201.

- reduction of, by micro-organisms, 1453.

reduction of, by the cholera bacteria, 76.

Nitric acid and copper, conditions of the reaction between, 701.

- estimation of, by diphenylamine, 415.

estimation of, by electrolysis, 1467.

- estimation of, by reduction to ammonia, 1025.

-estimation of, by Schulze and Tiemann's method, 1025.

 influence of, on the dissolution of zine in dilute sulphuric acid, Trans., 824.

- presence and behaviour of, in plants, 1021.

Nitric oxide, preparation of, 9. - - produced in the combustion of nitrogenous organic compounds with copper oxide, 292. -- peroxide, TRANS., 590. - --- combination of phosphorus pentafluoride with, 1052. - preparation of, Trans., 590. physical properties of, Trans., 591. variations in the electrical resistance of, with rise of temperature, Nitrification, 545. of ammonia, 282. Nitrifying organism, 1180. Nitriles, polymerisation of, 1158. - reduction of, 1407, 1422. Nitrites, estimation of, 193. - estimation of, in water, TRANS., Nitroazo-compounds, reduction of, by alcoholic ammonium sulphide, 1116. Nitrogen, amount of, in cow's milk, apparatus for the estimation of, in ammonium salts, 1341. arrangement in space of the atoms in compounds containing, 576. - arrangement in space of the atoms in the molecule of carbon compounds containing, 348. assimilation of, by Leguminosæ, — atmospheric, fixation of, 545.
— combustion of, at high pressures, 1050. combustions with copper oxide. quantity of nitric oxide produced in, **292**. - comparison of the methods of estimation of, 1466. density of, 1370. - detection of, in organic substances, estimation of, in ammonium magnesium phosphate, 291. -free, formation of nitrous acid and ammonia from, 1051. fixation of, 79, 814, 816.
fixation of, by Leguminosæ, 79. green manures as suppliers of, 1184. - in organic substances, estimation - in soil, influence of gypsum and clay on the conservation of, 545. iodide, action of, on organic compounds, 1402. - isomerism of organic substances containing, 1112.

Nitrogen, Jodlbauer's modification of Kjeldahl's method for the estimation of, in nitrates, 292. Kjeldahl's method of estimating, loss and gain of, by soil, 1023. ---- loss of, during the fermentation of nitrogenous matters, 1340. —— loss of, in acid fodders, 1339. - loss of, in estimation by Will and Varrentrapp's method, 1194. nitric and total, Kjeldahl's method of estimating, 1466. — of plants, source of, 1023. —— preparation of, 330. —— stereochemistry of, 1330. - total, estimation of, in manures, in fodders, estimation of, 1477. Nitrogen-acids, formation of, in combustion, 447. Nitrogen-compounds, geometrically isomeric, 1089. stereochemically isomeric 970. stereochemistry of, 575, 951. Nitroprussides, 1387. Nitroso-compounds, action of sulphurous anhydride on, 1305. Nitrosyl chloride, absorption spectrum of, 97. Nitrous acid, detection of, in saliva, 278. ---- detection of traces of, 415. — — ethereal salts of, 353.
— formation of, from free nitrogen, 1051. - -- in the atmosphere, 406. - anhydride, Trans., 590. - - action of on substances dissolved in carbon bisulphide, 1401. molecular weight of, Trans., 595. - compounds in sulphuric acid, test for, 922. ether, spirit of, estimation of ethyl nitrite in, 927. Nivenite, 458. Nonyl diphenyl tricyanide, 1352. Nonylic chloride, 1252. Nordenskiöldine, 1078. Nosean-bearing ejections Laacher See, 220. fromthe Nutmeg oil, 1150. Nutrition of higher plants, function of ammonium salts in, 79. Nutritive value of different albuminoïds, 394.

of wheat meal, 396.

0.

Oak-tannin, reaction of, 1275. Oak-tannins, oxidation of, 1130. Oats in the experimental plots at Grignon in 1889, 820. Oat-straw, composition of, 1461. Octacetylmelibiose, 1085. Octacetyltetramidotriphenylbenzene, Octohydrodiphenylfurfuran, TRANS., 955. Octose, 598. Octyl chloride, preparation of, 577. diphenyl tricyanide, 1252. Octylbenzene, 1100. Octylene, 592. Enanthaldehyde and pyrotartaric acid, condensation of, 593. Œnanthylidenebenzidine, 1299. Oil, ethereal of betel leaves, 135. — linseed, adulteration of, 1198. of birch, 256. — of camphor, 261. — of caraway, Norwegian, 902. of cassia, examination of, 423. — of cinnamon, examination of, 423. — of juniper, 902. of mace, 1150. — of mustard, amount of substances yielding, in various foods and their action on the animal body, 539. of nutmeg, 1150. - of peppermint, Russian, 1428. testing of, for adulterations, 199. of sesame, testing, 90. of wintergreen, 256. Oil-testing, 89. Oils, analysis of, 91. apparatus for the analysis of, 671. - essential, analysis of, 423. - - iodine absorption as a test for, 199, 307. Maumene's test for, 834. — reactions of, 199, 200. — examination of, 1247. — fixed, reactions of, 200. ---- Indian grass, 231. - optical examination of, 91. — wool, analysis of, 305. Oleic acid, addition of chlorine and halogen acids to, 1396. constitution of, 863.
process for the conversion of, into fatty acids, 863. - series, molecular weights of some members of, 737. Oleïn, commercial, examination of, for linoleïc acid, 306. Ononine, reaction of, 310.

Opianic oxime, Trans., 1070. Opium, estimation of morphine in, 94, Opium-preparations, colorimetric estimation of morphine in, 1349. Optics, chemical, studies in, with reference to the dissociation theory, 313. Orceïn, 1405. Orcin-aurin, 1111. Orcinol colouring matters, 762. - diethyl ether, dibromo-, 1405. preparation of, 1405. Orcirufamine, 764. Orcirufin, 763. - ethyl ether, 763. Oreoselon methyl ether, 1154. - nitro-, 1154. Organic compounds, detection of nitrogen in, 663. - estimation of sulphur in, 289. formulæ for calculating the molecular volume of, 323. - isomeric, antiseptic powers of, Trans., 636. quantity of nitric oxide produced in the combustion of, with copper oxide, 292. matter in soil, exhaustion of by cropping without manures, 407. - substances containing copper, analysis of, 296. - - exact determination of the melting point of, 1. - in alkaline solution, action of lead peroxide on, 20. Organism, behaviour of sulphur in, 812. Organisms, living, heats of combustion of the chief nitrogenous compounds in, - silicic acid, as a culture medium for, 1338. Orientation, influence of atoms or groups on, 484. Orsat apparatus, modified, 411. Orthoclase, formation of, 1080. Osazones, melting points and preparation of, 581. Osmosis with living and dead membranes, 207, 277, 1176. Osmotic experiment, 1365. pressure, kinetic nature of, 105. - nature of, 105, 441, 555, 846. - --- theory of, 846. Ossein, heat of combustion of, 938. Ostruthin, 1154. Oxaleneanilidoximeamidoxime, 124. Oxaleneanilidoximeazoxime-ethenyl,

Opal from John Davis River, Oregon,

Oxalenediamidoxime, 122. - diethyl ether, 123. Oxalenediazoximedibenzenyl, 123. Oxalenediazoximedipropenyldicarboxylic acid, 123. Oxalenediuramidoxime, 124. Oxalic acid, electrochemistry of, 100. - series, specific volumes of some ethereal salts of the, 102. Oxalyldimethylhydrazine, 23. Oxalylethylenephenylhydrazine, 250. Oxanilic acid, 1124. Oxanilyl chloride, 1124. Oxazolines, 1267. Oxidation in the blood, 651. Oxides, influence, of, on the decomposition of potassium chlorate, TRANS., 272. — mineral, synthesis of, 709. - more stable, behaviour of, at high temperatures, Trans., 269. Oximes, 251, 1412. isomeric, 1261. - of unsymmetrical ketones, 1263. isomerism of, 1263. — stereochemical isomerism of asymmetrical, 1263. Oxindole, bromamido-, 982. Oxyberberine, Trans., 1003, 1085.
— acetate, Trans., 1086.
— constitution of, Trans., 1085. Oxychlorides, metallic, formation of crystallised, 1058. Oxycinchine, 1433. Oxydiethylidenelactic acid, 959. Oxygen, absorption spectra of, 675. and the halogens, reciprocal displacement of, 6. atomic weight of, 330, 1370. - density of, 322, 1370. - dissolved in water, estimation of, Trans., 185. free, estimation of, in water, 412. - heat developed by the action of, on the blood, 274. hydrogen and chlorine, equilibrium between, 8. - moist, action of light on, Proc., 134. preparation from potassium ferricyanide and hydrogen peroxide, 352. preparation of, in a Kipp's apparatus, 8. - solubility of, in mixtures of alcohol and water, 103. Oxyhæmoglobin, stability of, 1012. Oxyhydrastinine, synthesis of, from methyl chlorethylpiperonylcarboxylate, Trans., 997, 1034. Oxylepiden, acicular, distillation of, TRANS., 688.

Oxypyridine bases, synthesis of, 67. Ozokerite, detection of, in beeswax, 421. Ozone, action of, on ether, TRANS., 584. - electrical conductivity due to the formation of, 676. - formation of, in combustion, 447. - formation of, during rapid combus-

Oxyphenyldinaphthazine, 910.

Oxylepidenic acid, crystallography of,

TRANS., 747.

- production of, by flames, Proc., 1890, 26.

the bladders of, 916.

 volumetric estimation of, 290. Ozothellia nodosa, gases contained in Ρ. Palladium, atomic weight of, 17. - effect of, on the freezing point of tin, Trans., 380. electrolytic estimation of, 831. Palmitone, preparation of, Trans., 985. Palmitoneoxime, TRANS., 986. Pancreas, effect of extirpation of, on the absorption of fat, 1171. Pancreatic juice, influence of, on the colour of the dejections, 397. Papaver rhæas, morphine from, 646. Papaverine, action of potash on alkyl halogen-derivatives of, 179. - bases formed by the action of potash on the alkyl halogen salts of, 271.Papaverinic acid, 180. Paper, effect of various substances on the combustibility of, 1458. estimation of wood fibre in, 670. Paposite, 456. Paracamphoric acid, 790. Paracoumarone, 496. Paraffin, detection of, in beeswax, 421. freezing points of solutions of, 463. Paraffins, absorption of the ultra-violet rays by derivatives of, 434. Paragalactan, 285. Paragalactan-like substances, 284. Paralactic acid, formation of, during the fermentation of sugar, 78. Paraldimine, 735. - amido-, 735. Paraldol, molecular weight of, 862. Paraldylhydrazine, 735. Parapropaldehyde, 955. Pargasite from Fiskernäs, Greenland, 19. Parpevoline, 796. Parvoline, 795.

Waage's constitution of, 1002.

Pathological effusions, 1173.

Peach-gum, carbohydrates in, 1022. Peas, fixation of free nitrogen by, 814. Peat soils, examination of, 192. Pectic compounds in plants, 80. Pentacetyllevulose, 732. Pentaglucoses, estimation of, 1352. Pentamethyldihydropyridine, 67. Pentamethyldihydropyrroline, action of methyl iodide on, 1431. Pentamethylene-derivatives, conversion of, into benzene, pyridine, and thio-phen derivatives, 129. Pentamethylene-ring, breaking the, 1091. Pentamethylphloroglucinol, 1110. Pentene,  $\gamma\gamma$ -octochloro-, 1256. Pentolamide, pentachloro- 1257. Pentose, 598. Pentoses, estimation of, 1352. Pentylene dibromide,  $\gamma$ -, 20. glycol,  $\gamma$ -, and its anhydride, 20. Pepper, analysis of, 95. · occurrence of piperidine in, 95. Peppermint, oil of, detection of adulterations in, 1199. ---- Russian, 1428. Peptone, 182. reactions of, 804. Peptones, analysis of, 1351. Peridinia, pigments of the, 1172. Peridinia-chlorophyllin, 1173. Peridinin, 1173. Peridotite from Arkansas, 345. Permanganate, standardisation of, 196. Permanganates, compounds of ammonia with, 947. - metallic, action of compounds of ammonia with, 947. Permanganic acid and the permanganates, action of hydrogen peroxide on, 1062.Perseïtol, identity of heptitol with, 1232. Petrographical research, evidence afforded by, of chemical change under great pressure, Trans., 404. Petrography of South-West Africa, 221. Petroleum, Baku, acids poor in carbon from, 737. constitution of, 223. — estimation of, in turpentine, 669. - raw, sulphur compounds in, 350. -residues, sulphur compounds in, 350. Peucedanin, 1154. Pharmacolite from the Vosges, 342. Phaseolus vulgaris, galactan in the seeds of, 917.

Phenacetide, dinitropara-, 751.

Phenacylparatoluidine, 524.

Phenacylisoamylacetic acid, 1101.

Phenacylisoamylmalonic acid, 1100.

Phenacylmetanitroparatoluidine, 525.

Phenacylphthalimide, metanitro-, 372.

Phenamidophenolsulphonic acid, 159. Phenanthraquinone, action of cinnamaldehyde and ammonia on, TRANS., 11. Phenanthrene perhydride, 637. synthesis of, 515. Phenanthraquinone, action of ammonium formate on, 784. - compounds of, with metallic salts, Trans., 4. - mercuric chloride, Trans., 6. - mercuric cyanide, Trans., 7. reduction of, Proc., 1890, 31. - zinc chloride, TRANS., 5. Phenanthridine, 390. Phenanthrone, Proc., 1890, 31. Phenanthrylpiperidine, tertiary, 1003. Phenethyldihydroketometadiazine, 178. Phenethyldihydrothiometadiazine, 178. Phenethyldiketometadiazine, 1254. Phenetidine, dinitro-, 751. Phenetoil, paranitro-, reduction of, 1119. synthesis of ketones from, 963. Phenetoilphthaloylic acid, 1128. Phenol, action of nitrogen iodide on, 1402. action of nitrous anhydride on, 1401. action of phosphorus trichloride on, 34. chlorodibromoand bromodiehloro-, and their conversion into quinone, 1108. – crude, examination of, 425, - ε-dinitro-, 751. — dinitrometadibromo-, 1107. - dinitrometadichloro-, 1107. - estimation of, in commercial carbolic acid, 300. - ethers, synthesis of ketones from, by Friedel and Crafft's method, 962. — hemicamphoride, 1427. — metanitrothio-, 604. – monocamphoride, 1427. - orthamido-, action of chlorine on, 754, 1255. -tribromo-, action of sulphuric acid on, 883. Phenols, action of nascent nitrous acid on, 38. combination of camphor with, 1427.compounds of benzotrichloride with, 901. - compounds of volatile fatty acids with, 488. desmotropy in, 243, 1404. - dihydric and trihydric, physiological action of, 1019.

electrical conductivity of, 677.

iodo-, reduction products of, 1402.

Phenallyldihydroketometadiazine, 178.

Phenamidophenol, 158.

Phenols, nitroso-, action of hydroxylamine on, 1403. orthamido-, oxidation products of, 1444. volumetric estimation of, 1473. Phenomalic acid, trichloro-, constitution of, 365. Phenomethyldihydroketometadiazine, oxidation of, 1254. Phenomethyldihydrothiometadiazine, Phenomethyltriazine, a-, 149. - parabromo-, 152 Phenotriazine, a-, 149, 613. parabromo-, 152. Phenoxycrotonic acid,  $\beta$ -, 361. Phenoxyethylamine salts, 373. Phenoxyethylphthalamic acid, 373. Phenoxyethylphthalimide, 373. Phenoxypropylene, \$6-, 362. Phen-α-phenylparazoxime, 523. Phenyl bisulphide, metanitro-, 604. carbonate, reactions of, 750. cyanate, preparation of, 962. - synthesis by means of, 759. -  $\Delta^{1:4}$  dihydroterephthalate, 1132. – ethylxanthate, 603. - acetylparamido-, 605. — paramido-, 604.
 — Δ<sup>2 cistrans</sup> hexahydroterephthalate, 1134. – α-naphthyl sulphide, 1292. phenacyl ether, metanitro-, 523. — phenylthiocarbamate, Trans., 268. propionate, 488. - salicylate, nitro-derivatives Δ¹ tetrahydroterephthalate, 1133. Δ²- cistrans tetrahydroterephthalate, - thienyl ketone, stereochemically isomeric oximes of, 1294. – thiocyanate, 749. — tolylcarbamate (ortho-), 751. 🗕 tolylcarbamate (para-), 750. trithioformate, oxidation of, 988. Phenylacetic acid, metabromodinitro-, Phenyl- $\beta$ -acetylisocrotonic acid,  $\gamma$ -, 375. Phenylacetylpyrazole, [1-], 798. Phenylacetylpyrazoleoxime, [1-], 798. Phenylacetylpyrazolephenylhydrazone, [1-], 798. Phenylallenylamidoxime-derivatives, 41. Phenylallenylcarbonylimidoxime, 43. Phenylallenylethoxime nitrite, 41. Phenylallenylphenyluramidethoxime, Phenylallenylphenyluramidoxime, 42. Phenylallenyluramidoxime, 42.

Phenylamidoacetanilide, action of carbonyl chloride on, 1164. Phenylamidobiazolone, 1441. Phenylamidoethylpiperonylcarboxylic anhydride, Trans., 1036. Phenylammeline, 618. Phenylamylcarbamide, 1388. Phenylamylthiocarbamide, 1388. Phenylangelicalactone, 377. Phenylanilidobromomethyl-methylanilidopyrazolone, 643. Phenylanisylethane, 1423. Phenyl-γ-anisylpropylamine, β-, 1423. Phenylazimidobenzene, ortho-, 1113. Phenylazimidohenzoic acid, 374. Phenylazimidonaphthalene, 787. Phenylazonaphtharesorcinol, nitroso-, Phenylazophenylbiazolone, 1441. Phenylazophenyldithiobiazolone, 1441. Phenylazophenylthiobiazolone, 1440. Phenylazophenyl-\psi-thiobiazolone, 1441. Phenylazo-ar.-tetrahydro-a-naphthol, Phenylazothymol, constitution of, 884. Phenylbenzhydrylorthobenzoic lactone, Phenylbenzoylorthobenzoic acid, 514. Phenylbenzoylpyrazole, [1-], 798. Phenylbenzoylpyrazoleoxime, [1-], 799. Phenylbenzoylpyrazolephenylhydrazone, [1-], 798. Phenylbenzylorthobenzoic acid, 514. Phenylbenzyloxycarbamide, 1127. Phenylbenzyloxythiocarbamide, 1126. Phenylbromisovaleric acid, 776. Phenylbromobutyric acid, 891. Phenylbromoparaconic acid, 894. Phenylbromopropionic acid, orthonitrometachloro-, 1127. Phenylbromopyrazole, [1-], 797. Phenylbromopyrazoledicarboxylic acid, Phenylbutene-a-hydroxy-w-dicarboxylic acid, orthonitro-, 163. Phenylbutine methyl ketone, paranitro-, Phenylbutinecarboxylic acid, paranitro-, Phenylbutine-ω-dicarboxylic acid, orthonitro-, 163. Phenylbutylene, 777. Phenylbutyrolactone, action of halogen acids on, 891. Phenylcarbizinecarboxylic acid, amido-, Phenylchlorobutyric acid, 891. Phenyl-β-cinnamenylacrylonitrile, α-, Phenylcrotonic acid, a-thio-, 362.

— β-thio-, 361.

Phenyldehydrohexonecarboxylic acid, TRANS. 308.

Trans., 308. Phenyl- $\gamma\delta$ -dibromethyl- $\beta$ -bromacrylic acid, 162.

Phenyldibromopropenylethoxime chloride, 42.

Phenyldibromopyrazole, [1-], 797.

Phenyldichlorohydroxypyridonecarboxylic acid, 965.

Phenyldihydroquinazoline, 72.

Phenyldimethylbromopyrazole, 1165.

Phenyldimethylglyoxaline, Trans., 9. Phenyldimethylquinolylthiocarbamide, 1005.

Phenyldiketomethylanilidobromopyrrolidine, 642.

Phenyldiketomethylanilidodibromopyrrolidine, 642.

Phenyldiketomethylanilidodichloropyrrolidine, 643.

Phenyl-β-dinaphthylcarbamide, 634.
Phenyldisazothymol, constitution of,

Phenyldithienyl, 1420.

---- dinitro-, 1421.

---- tribromo-, 1420.

Phenyldithienyldisulphonic acid, 1421. Phenylene bisulphide, para-, 605.

Phenyleneamidinebenzenylorthocarboxylic acid, 970.

Phenylenediamine, meta-, preparation of, from resorcinol, 245.

ortho-, oxidation of, 800.

Phenylenediamines, condensation of, with acetaldehyde, 139.

--- condensation of, with butaldehydes, 138.

Phenylenenaphthylenemethane oxide,  $\beta$ -, 901.

Phenylenepyridineketonedicarboxylic acid, α-, 1008.

Phenylenepyridineketonedicarboxylic, acid,  $\beta$ -, 1009.

Phenylenepyridineketonedicarboxylic acids, formation of, by the oxidation of naphthaquinoline derivatives, 1007.

Phenylenequinaldine, amido-, 1298. Phenylethoxythiocarbamide, 1126. Phenylethylhydrazine, orthamido-, 612.

Phenylfurfuracrylonitrile, a-paramido-, 1408.

---- α-paranitro-, 1408.

Phenylglycinparatoluidide, 1285. Phenylglycuronic acid, 1286.

Phenylglyoxal, 51.

Phenylglyoxalinedicarboxylic acid, 1440.

Phenylglyoxylic acid, orthonitro-, isomeric hydrazones of, 1117.

- stereochemically isomeric oximes of, 1274.

Phenylglyoxylic hydrazone, orthonitro, 1117.

\_\_\_\_ metanitro-, 1117.

methylphenylhydrazone, ortho-, 1118.

Phenylhexamethylene, derivatives of, Trans., 304.

— methyl ketone, Trans., 320. — oxime, Trans., 321.

Phenylhexamethylenecarboxylic acid, Trans., 316, 322.

Phenylhexamethylenedicarboxylic acid, Trans., 315.

Phenylhydrazides, formation of, 152. Phenylhydrazido-a-hydroxybutyric acid, pseudo-, and its derivatives, 155.

Phenylhydrazidomandelic acid, pseudo-, 156

Phenylhydrazine, action of, on the skin, 582.

- inorganic derivatives of, 617,

—— metanitro-, 150. —— orthonitro-, 148.

--- parabromorthonitro-, 151.

---  $\beta$ -phthalylphenylhydrazinate, 1327.

— pyrocinchonylphenylhydrazinate, 1327.

Phenylhydrazines, nitro-, action of heat on, in presence of various liquids, 40.

—— symmetrical nitro-, of the aromatic

series, 40.

Phenylhydrazonelevulinic acid and anhydride, paranitro-, 41.

— anhydride, 70.

Phenylhydrazonepyruvic acid, paranitro-, 41.

Phenylhydrazones, 40.

Phenylhydrazophenylbiazolone, 1441.

Phenylhydrazophenyldithiobiazolone, 1441.

Phenylhydrazophenylthiobiazolone, 1441.

Phenyl-γ-hydroxybutyramide, 890. Phenyl-β-hydroxy-α-isoamylethylmalonic acid, β-, 1101.

Phenylhydroxypyrimidinecarboxylbenzamidine, 69.

Phenyl-α-hydroxysuccinic acid, α-, 1135.

Phenyl-α-hydroxysuccinic acid, β-, 1136. Phenylhydroxythiocarbamide, 1126.

Phenylhydroxyvaleric acid, salts of, 776.

Phenylimidophenyl, 490.

Phenylindole, 3'-, reactions of, 57.

Phenyliodobutyric acid, 891.

Phenyl-α-isoamylbutenyllactone, γ-, 1101.

Phenyl- $\alpha$ -isoamylbutyrolactone,  $\beta$ -, 1101.

Phenylisobromoparaconic acid, 895.

Phenylisocrotonic acid, chloro-, 620. — α-thio-, 362. — acids, dichloro-, isomeric, 620. Phenylisocyanuric acid, 618. Phenylisophthalic acid, 1284. Phenylisovalerolactone, 776. Phenylitaconic acid, 894, 895. Phenylizinedihydroxytartaric acid, metanitro-, 151. Phenylketodihydroquinazoline, 72. Phenylketohydrazodihydroquinazol-Phenyllactamide, orthonitrometachloro-, Phenyllactic acid, orthonitrometachloro. **1127**. azine, 526. Phenyl-\beta-lactic acid methyl ketone, orthonitrometachloro-, 1128. azine, 270. Phenylmaleïc acid, 1136. - anhydride, 1136. 1286.Phenylmalic acid, 1135. Phenylmalic acid,  $\alpha$ -, 1135. Phenylmalic acid,  $\beta$ -, 1136. Phenylmetanitroparatolylcarbamide, Phenylmethoxythiocarbamide, 1126. Phenylmethylacetonylhydroxypyrimidine, 70. Phenylmethylbiazoline, 1442. Phenylmethylchloropyridazone, 71. 1113.Phenylmethyldichlorobiazolone, 1441. Phenylmethylethoxypyridazone, 71. Phenylmethylhydrazine, orthamido-, Phenylmethylhydroxypyridazone, 71. Phenylmethylhydroxypyrimidineacetic acid, 69. Phenylmethylhydroxypyrimidinepropionic acid, 70. Phenylmethylimidobiazole, 1442. Phenyl-\(\beta\)-methylpiperidine, orthoparadinitro-, 1004 - paranitro-, 1003. Phenylmethylpropylene-\psi-thiocarbamides, 159. Phenylmethylpyrazole, 71. Phenylmethylpyrazolecarboxylic acid, Phenylmethylpyrazolone, 796, 1269.Phenylmethylpyrazoloneazobenzene, 29. Phenylmethylpyrazoloneketophenylhydrazone, 28. Phenylmethylpyridazone, 71. Phenyl-\(\beta\)-methyltaurocarbamic anhydride, 159. Phenylmethyltriazolecarboxylic acid. oxidation of, 1165. Phenyl- $\beta$ -naphthindole, [2'-], 57. Phenyl-B-naphthindole, [3'-], 57. a., 381. Phenylnaphthylamine, amido-, action of nitrous acid on, 788.

Phenyl-a-naphthylamine, thio-, 1307. Phenyl-\(\beta\)-naphthylamine, azo-derivatives of, 990. Phenylnaphthylamine-blue, 1308. Phenyl-B-naphthylcarbamide, metrical, 633. - chloride, 633. Phenyl-a-naphthylcarbazole, 1307. Phenylnitrososulphone, 781. Phenylorthamidotolylcarbamide, 760. Phenylorthobenzylenediamine, 1258. Phenylorthonaphthylenediamine, Phenylorthotolyldichlorodiketoparadi-Phenylorthotolyldiketodilydroparadi-Phenylorthotolyl- $a\gamma$ -diketopiperazine, Phenylorthotolylsemithiocarbazide, Trans., 259. Phenyloxazoline,  $\mu$ -, 1267. Phenylparachlorophenylhydrazine, adinitro-, 1119. Phenylparaconic acid, 621. - bromo-, 895. — acids, dichloro-, isomeric, 619. Phenylparamidotoluene, orthonitro-, Phenylparatolylamine, 609. Phenylpentamethylene bromide, Trans., 313. glycol, 311. Phenylphenyllydrazine, orthoparadinitro-, derivatives of, 1259. Phenylphosphoryl dichloride, 34. - tetrachloride, 35. - thiochloride, 35. Phenylpropylene, a-thio-, 362. Phenylpropylene-\psi-thiocarbamide, 159. Phenylpseudohexylcarbamide, symmetrical, 474. Phenylpseudohexylthiocarbamide, symmetrical, 474. Phenylpyrazole, derivatives of, 1164. Phenylpyrazoledicarboxylic acid, 1164. Phenylpyrazolonecarboxylic acid, 156. Phenylquinazoline, 1442 Phenylquinonediimide, 609. Phenylrosinduline, 909. —— amido-, 765. Phenylsalicylic acid, 892. - dinitro-, 89**3**. tribromo-, 893. Phenylsuccinazone, 1120. Phenylsulphonacetone, 780. Phenylsulphonamic acid, 1137. Phenylsulphone-a-bromopropionic acid. Phenylsulphonepropionic acid, a-, 381. Phenyltetrahydroquinazoline, 73.

Phenylthiazoline, 524. Phenylthiocarbamide, 1291. - action of allyl bromide on, TRANS., 301. - action of benzyl chloride on, TRANS., 295. Phenylthiocarbamideallyl cyanide, Phenylthiocarbamidebenzyl cyanide, Phenylthiocarbamideethyl cyanide, Phenylthiocarbamidemethyl cyanide, Phenylthiocarbamidepropyl cyanide, Phenylthiophen and its derivatives, Phenylthiophensulphonic acids, 134. Phenylthiouramidocinnamic acid, ortho-, 1123. Phenyltoluquinoxaline, constitution of, Phenyltolylamine, paramido-, 610. - paranitroso-, 609. Phenyltriazolecarboxylic acid, 1166. Phenyltriazoledicarboxylic acid, 1165. Phenyltribromopyrazole, [1-], 797. Phenyltrichloropyridone, 965. Phenyltrichloropyridonecarboxylic acid, Phenyltrimethylmethane, amido-derivatives of, 1296. — nitro-derivatives of, 1296. Phillipsite from Somoskö, 718. Philothion, 905. Phleïn, molecular weight of, 227. Phloridzin diabetes, 1336, 1337. Phloroglucinol, 136. — acetate, tribromo-, 1109. - action of bromine on, 1108. —— action of chlorine on, 488. —— methyl-derivatives of, 1110. physiological action of, 1019. – tribenzoate, 136. Phonolites from Colorado, 1075. Phorone, 769. Phoronepyrroline, 1000. Phosphates, natural, analysis of, **2**93. Phosphonium sulphate, 9. Phosphorescence of copper, bismuth, and manganese in the sulphides of the alkaline earth metals, 201. Phosphoric acid and boric acid, a derivative of, 108. - estimation of, in presence of silica, 825. estimation of, in slags, 292.
——in soil, exhaustion of by continuous cropping without manures, 407.

- - separation of vanadic acid from, 1343. - - the citrate method of estimation of, 416. Phosphorites from the Government of Smolensk, 1071. Phosphorous acid, ethereal salts of, 858. - oxide, Trans, 545. - action of chlorine on, TRANS., 572.- action of heat on, Trans. 552. - action of light on, TRANS., 552. action of oxygen on, Trans. 569.- action of ozone on, Trans., 571. action of water on, Trans... 567. --- crystallography of, TRANS., **554**. — — dispersion of, Trans., — magnetic rotation of, Trans., dispersion of, Trans., 566. 567. — molecular weight of, Trans., - - physiological action Trans., 573. - refraction equivalent of, Trans., 564. - - relative density of, TRANS., 557. - specific volume of, Trans.. --- thermal expansion of, TRANS., Phosphor-tin, estimation of phosphorus Phosphorus, action of light on, Trans., - amorphous, properties of, Trans., 599. - dissolved, molecular weight of. 447. estimation of, in phosphor-tin, 83. - in iron, Götz's method of estimating, 416. odour of, Trans., 573. pentafluoride, combination of, with nitrogen peroxide, 1052. specific volume of, TRANS., 562. - total, estimation of, in urine, 825. - trichloride and oxychloride, method of distinguishing, 664. Phosphosiderite, 1073. Phosphotrimetatungstic acid, 704. Phosphovanadates, 1067.

Phosphoric acid of mineral origin, re-

cognition of, 83.

Photobacterium phosphorescens, 998. Photographic plate, measurement of the relative density of the deposit on, Phthalaldehydic acid, action of orthodiamines on, 969. Phthalamidodiphenylamine, 609. Phthalanilphenyl phenylcarbamate, 761. Phthalic acid, reduction products of, 1275.Phthalimides, substituted and their conversion into the corresponding amines, Phthalimidine, derivatives of, thio-, 1250.Phthalimidopropiophenone, 372. Phthalodiphenyline, 167. Phthalylchloracetic acid, 785. Phthalyldiethylbenzidine, 1297. Phthalylorthamidoquinoline, 1324. Plıykopyrrin, 1173. Physiological action and chemical constitution, relation between, 280. and optical properties of inorganic substances, parallelism between, 813. of hyoscine hydrochloride, 1019. - of morphine and its derivatives, 1178. - --- of phosphorous oxide, Trans., 571. — of pituri and nicotine, 1178.
— of related chemical compounds: toluidines and phenols, 1018. of selenious acid, 542.
of sulphonal, 542. of thallium salts, 1452.
of the active principle of jequirity, 398. - of the cresols, 813. rôle of lactose, 186. Physiology of tannins, 186. Phytosterin, 74, 649. Piaselenole, 160. amido-, 161. Piaselenoles, 972. Piazothiole, 161. Piazothioles, 972. Picoline,  $\beta$ -, new synthesis of, 1394. the second, 1432. Picolylalkine, a-, 67. Picolylethylalkine, a-, 1436. Picolylfurylalkine, a-, 1437. Picolylmethylalkine, a-, 68. Picraena excelsa, constituents of, 791. Picrasmic acid, 792. Picrasmin, 792. Picric chloride, action of, on ethyl sod-acetoacetate, 1418. Picrylmetachlorophenylhydrazine, 1119. Picryl-a-naphthylliydrazine, 40.

Picrylparachloropheny!hydrazine, Picrylparatolylhydrazine, 40. Picrylphthalimide, 374. Pig, digestion in the, 183. Pigments of the Peridinia, 1172. Pilocarpine ferrocyanide, 1318. Pinacoline, oxidation of, 237. Pinene, 1315. - constitution of, Trans., 964. Pinite, β-, 244. Pinole and its derivatives, 169. nitrosochloride, 170. Pinoleglycol ethyl ether, 170. Pinolenitrolamine, 170. Pinolenitrolaniline, 170. Pinolenitrolbenzylamine, 170. Pinolenitrol-\(\beta\)-naphthylamine, 170. Pinolenitrolpiperidine, 170. Pinus abies, terpene from, 789. Pinus cembra, dextrorotatory terpene from, 789. Pipecolylalkine, α-, 67. Pipecolylethylalkine, a., 1436. Pipecolylfurylalkine, a., 1437. Pipecolylmethylalkine,  $\alpha$ -, 68. Piperazine group, stereochemical studies in, 1331. Piperic acid, oxidation of, 1274. - synthesis of, 1129. Piperidine and alcohol, products of the action of heated zinc-dust on, 1429. and other basic substances, equilibrium between, 1363. --- bases, 1002. - synthesis of, 67. occurrence of, in pepper, 95. - thermochemistry of, 101, 1363, 1368. Piperidylrhodamine, 1003. Piperon, 80. Piperonylketonic acid, 966. Pituri, physiological action of, 1178. Piuri, 504. Plagioclase, artificial formation of, 718. Plant, elaboration of nitrates in the, 1182importance of chlorine in the, Plants, ammonia in the nutrition of, 287. – boric acid in, 656. calcium oxalate crystals in, 1182. — cholesterin in, 1457. – diffusion of alumina in, 818. — green, assimilation of carbon from certain compounds by, 818, 1021. fat-decomposing ferments in, 1455. - formation of calcium oxalate in, formation of nitrates in, 543.

Picrylorthotolylhydrazine, 40.

- Plants, function of tannin in, 819.

   higher, function of ammonium salts in the nutrition of, 79.
- influence of acids on the evolution of gases by, 190.
- influence of the composition of the soil on the physical properties of, 81.

   occurrence of boron in, 1338.

--- pectic compounds in, 80.

- presence and behaviour of nitric acid in, 1021.
- --- rôle of potassium in, 917.
  - source of nitrogen of, 1023.
- Plant-shoots, etiolated, formation of cane-sugar in, 282.
- Platinic chloride, heat of formation of, 439.
- Platinum black, very active, preparation of, 453.
- and gold alloys, liquation of, 947.

— tetrafluoride, 217.

Platososemiamine chloride, 1218. Plattnerite from Idaho, 339.

Pleonectite from Sweden, 112.

Pleurasite, 1076.

- Pleurisy, nature of the effusion in, 1173.
- Pogonopus febrifugus, constituents of the bark of, 404.

Poison of corn cockle seeds, 1458.

Poisoning cases, detection of mercuric eyanide in, 198.

Polarisation, circular, of certain tartrate solutions, 313.

maximum, of platinum electrodes in sulphuric acid, 316, 551, 675, 676.

— of electrodes, 933.

of platinum electrodes in dilute sulphuric acid, 316, 551, 675, 676.

Polyazo-compounds, 1118. Polycrase from California, 854.

Polygalic acid, 262.

Poppy cake, estimation of fat in, 306. Porcelain, Chinese, rocks used in the manufacture of, 461.

—— constitution of, 1074.

Porphyrite bosses in New Jersey, 345. Potassammonium, 210, 450, 560, 679.

— heat of formation of, 319.

Potassium aluminium silicates, 13.

ammonium thiosulphate, 564.

- — solubility of mixed, 442.
   antimony tartrate, circular polarisation of, 313.
- arsenate, action of, on sesquioxides, 1377.
- aurochloride, anhydrous, 1217. — beryllate, 698.
- borotartrate, circular polarisation of, 314.
  - VOL. LVIII.

- Potassium bromide and chloride, solubility of mixed, 443.
- and iodide, solubility of mixed, 443.
- ---- cadmium thiosulphates, 1057.
- --- carbonate and hydroxide, reduction of, by magnesium, 332.
- of, Trans., 760.
- --- chloride and iodide, solubility of mixed, 443.
- ---- chromiodate, 107.
- combination of ammonia with,
- dichromate, influence of, on the decomposition of potassium chlorate, Trans., 280.
- --- estimation of, in soils, 668.
- —— ferricyanide, preparation of, 352.
- of, 352.
- —— volumetric estimation of, 834.
- ferrocyanide, non-poisonous nature of, 281.
- —— fluoroxyhypomolybdate, 703.
- ---- hydrogen malonate, 740.
- 450. sulphate, new hydrate of,
- tartrate, estimation of, in wine, 427.
- hydroxide, vanadium in, 706.
- iodide, solubility of, 443.
- by oxygen and light, 7.
- —— in urine, estimation of, as hydrogen potassium tartrate, 187.
  - iridosochloride, 1068.
  - lead chromates, 1065.
- molecular refraction of the halogen salts of, 549.
- molybdoiodate, 107.
- nitrate, influence of, on the decomposition of potassium chlorate, Trans., 282.
- nitrosoplatinochloride, 709.
- —— pentathionate, 1210.
- permanganate, action of hydrogen arsenide on, 1210.
- gas-volumetric estimation of,
- position of potassium chlorate, Trans. 280.
- ---- plumbate, 109.
- propionate, electrolysis of, 1236.
- pyroxyhexathiovanadate, 1381. quadromalonate, 740.
- ---- quadroxalate, 740.

Potassium rhodium chloride, 1383.	Propionylanisoïl, para-, 963.
———— nitrite, 1382.	Propionylbenzoic acid, orthopenta-
råle of in plents 01/7	
rôle of, in plants, 917.	chloro-, 785.
—— silicofluoride, 694.	Propionylchlorodibromophenol, 1108.
—— succinate, heat of formation of, 320.	Propionylmetadiethoxybenzene, 964.
	Propionyl-a-naphthyl methyl ether,
gen and carbon, 1053.	964.
- sulphatoiodate, 107.	Propionylnitrodibromophenol, 1107.
sulpho-a-naphthyl bisulphide, 606.	Propionylphenetoïl, 964.
ethylxanthate, 606.	Propionylphenylhydrazine, 1328.
sulpho-β-naphthyl bisulphide, 606.	Propionylpropaldehyde, 357.
ethylxanthate, 606.	Propiophenone hydrochloride, amido-,
tetrathionate, 1210.	372.
tungstoiodate, 107.	Propyl acetate, a-dibromo- and a-di-
- urate, thermochemistry of, 1040.	bromo-, 1084.
Potato, sweet, carbohydrates in, 1022.	
	alcohol, normal, compound of cal-
Potatoes, experiments at Rothamsted on	cium chloride with, 465.
the growth of, 409.	benzoate, $\beta$ -amido-, 1268.
in the experimental plots at	—— β-chloroquartenylate, 865.
Grignon, in 1889, 820.	—— chloroxalate, 236.
Potato-shoots, solanidine in, 1182.	β-ethoxyquartenylate, 865.
Potential, fall of, at the cathode, in	—— hydrogen sulphate, $\gamma$ -amido-, 473.
	O isobutowas automate, 7-amitto, 475.
Geissler's tubes, 1035.	B-isobutoxyquartenylate, 866.
difference of, between two dilute	\( \beta\)-methoxyquortenylate, 865
solutions of binary electrolytes, 1355.	— phenyloxamate, 235.
Precipitation, 847.	phosphite, 859.
Pressure, effect of, on chemical action,	β-propoxyquartenylate, 865.
TRANS., 408.	- trichlorolactate, normal, 27.
osmotic, theory of, 846.	Propylacetanilide, 758.
Talama and termonature relation	
volume and temperature, relation	Propylallylthiocarbamide, 476.
of, in the case of liquids, 321.	Propylamine, β-bromo-, derivatives of,
Propaldehyde and propaldehyde-am-	859.
monia, pyridine-derivatives from, 794,	—— derivatives of, 472, 1089.
1002.	di- and tri-bromo-, 228, 229.
- and succinic acid, condensation of,	hydrobromide, γ-bromo-, 1090.
587.	Propylammonium propyldithiocarb-
a-dichloro, 955.	amate, 476.
—— polymeric modifications of, 955.	Propylaniline, 758.
—— tribromo-, 861.	Propylbenzamide, β-bromo-, 860.
Propane hydrate, 1386.	β-chloro-, 1268.
Propargylamine and its derivatives,	Propylbenzene, action of chromyl chlor-
229.	ide on, 978.
Propenylbenzene-derivatives, conversion	nitration of, 962.
of allylbenzene-derivatives into, 748.	Propylbenzenes, ortho- and para-bromo-,
Propenyltoluyleneamidine, 1115.	503.
Propiolic acid, bromo-, action of aro-	Propylbenzenesulphonic acids, normal,
matic amines on, 371.	503.
—— acids, substituted, 27.	Propylbenzoyldextroecgonine hydro-
Propionamide, thermochemistry of,	chloride, 913.
1360.	Propylene, amido-, 860.
Propionic acid, bromodichloro-, 27.	bromide, action of ammonia on,
alactrochemistry of 100	952.
electrochemistry of, 100. electrolysis of, 1236.	
—— electrolysis of, 1256.	—— mercaptan, 950.
tetrachloro-, 27.	—— thiocyanate, 950.
—— tetrachloro-, 27. —— tribromo-, 861.	—— selenocyanate, 950.
anhydride, α-dichloro-, 1328.	Propylenecarbamide, 128.
action of phenyl-	Propylene-ψ-carbamide, 859.
hydrazine on, 1327.	Propylenediphenylsulphone, 988.
Propionitrile, action of, on chlorides of	Propyleneoxidecarboxylamide, tri-
fatty acids, 726.	chloro-, 234.
solid a-dichloro-, molecular weight	
of, 726.	bromide, 880.

**Propylenethiocarbamide** methiodide, 128. Propylene- $\psi$ -thiocarbamide, 127, 859. Propylethylthiocarbamide, 476. Propylformanilide, 758. Propylhexamethylene, 1320. Propylidenediethylsulphone, 56. Propylisobutenyltricarboxylic acid, Propylitaconic acid, 589. Propylitamalic acid, salts of, 588. Propylmercaptomethylthiazoline, 860. Propylmercaptophthalimide, 472. Propylmetachlorotoluene, para-, sulphonic derivatives of, 779. Propylmetaxylene, 1249.  ${f Propylmetaxylenesulphanilide, 1249.}$ Propylmetaxylenesulphonamide, 1249. Propylmetaxylenesulphonic acid, 1249. Propylmethylthiocarbamide, 476. Propylortho-xylene, 1249. Propylortho-xylenesulphonamide, 1249. Propylortho-xylenesulphonic acid, Propylparaconic acid, 588. Propylparaxylene, 1249. Propylparaxylenesulphanilide, 1249. Propylparaxylenesulphonic acid, 1249. Propylphenylthiocarbamide, 477. Propylpropargylamine, 230. Propylpyrroline, [1-], 66, 908. Propylsulphonic acid, γ-amido-, 1090. Propylsulphuric acid, γ-amido-, 1090. Propylthiocarbamide, 476. - bromo-, 1090. Propylthiocarbamidebenzyl cyanide, Propylthiocarbamideethyl cyanide, Propylthiocarbamidemethyl cyanide, Propylthiocarbamidepropyl cyanide, Propylthiocarbimide, 476. Propyltrimethylammonium iodide, iodo-, 357. Propyltriphenylpyrrolone, crystallography of, Trans., 738. Propylxylenes, 1249. Proteïd-hydrolyst, Trans., 531. Proteids, a cyanogen reaction of, 1032. - artificial digestion of, 275. — in urine, 1174. — heat coagulation of certain, 272. — of liver and kidney cells, 1014. of various grasses, composition and digestibility of, 657. Proteinchrome, 804. Proteïnchromogen, 804. Protoplasm, living vegetable, 283.

Pseudoazimides, 787. Pseudobrookite, from Havredal, Norway, 219. from Vesuvius, 712. Pseudobutylene, brominated derivatives of, geometrical isomerism of, 1218. Pseudocumyl methyl ketone, 981. Pseudocumylhydrazine, Trans., 54. Pseudocumylhydrazinepyruvic acid, Trans., 55. Pseudocumylsemicarbazide, Trans., 55. Pseudodihexyloxamide, 474. Pseudohexyl alcohol, 474. Pseudohexylamine, 474. Pseudohexylcarbamide, 474. Pseudoitaconanilic acid, 368. chloride, 369. Pseudoitacon-α-naphthalic acid, 369. Pseudoitaconparatolilic acid, 379. Pseudoitaconphenylhydrazilic acid, 369. Pseudomeconine, Trans., 1072. Pseudomeconinic acid, Trans., 1073. Pseudomethyltarconic acid, 532. Pseudophenylazimidonaphthalene, 788. Pseudopianic acid, constitution of, Trans., 1001. fusion of, with potash, TRANS., 1067. - - preparation of, Trans., 1064. - reduction of, Trans., 1072. — oxime, Trans., 1069. - action of heat on, Trans., 1070. Pseudotriphenylmelamine, nature of, 1254.Psilomelanes, 570. Ptomaines, 1170. Purpura lapillus, colouring matter of, 1452.Purree, 504. Putrefaction of serum albumin, gases evolved in the, 78. Pyocyanin, 189. Pyrargyrite from Kajénel, Transylvania, 1070. Pyrazole, synthesis of, 1009. Pyrazole,  $\beta$ -, derivatives of, 1439. Pyrazole-bases, compounds of alloxan with, 645. Pyrazolebenzoic acid, ortho-, 800. Pyrazolebenzoic acid, para-, 799. Pyrazole-4: 5-dicarboxylic β-, 1439.Pyrazole-group, 1244. Pyrene, formula of, Proc., 1890, 103, Pyridine and other bases, equilibrium between, 1364. β-chloro-, derivatives of, 130. constitution of, 1432. compounds of, with mercury salts. 643.

Pyridine, thermochemistry of, 101, 1363, 1368. Pyridine-bases, betaines of, 1431. compounds of, with acids of the acetic series, 1156. - estimation of, in gas-liquor, 1349. Pyridinebetaïne, 1431. Pyridinecarboxylic acid, bromo-, 177. Pyridine-derivatives, conversion of pentamethylene-derivatives into, 129. from anilidopyrotartaric acid, 642. from propaldehyde and propaldehyde-ammonia, 794, 1002. Pyridineorthocarboxylic acid, 1157. Pyridines and their relations to quinoline, isoquinoline, and the alkaloïds, Pyridine-series, synthesis of alcohol acids of the, 520. Pyridylacrylic acid, 520. Pyridylglyceric acid, 521. Pyridyl-a-lactic acid, 520. Pyridyl-\beta-lactic acid, 520. Pyridyl-ω-trichloropropylene, 520. Pyrimidines, 69. Pyrites, burnt, estimation of sulphur in, estimation of sulphur in, 413. Pyrobenzylphosphinic acid, 767. Pyrobenzylthiophosphinic acid, 767. Pyrocinchonic acid, relation of, to the dimethylsuccinic acids, 743. - anhydride, action of phenylhydrazine on, 1327. Pyrocinchonylphenylhydrazines, a- and β-, 1327. Pyrocoll and its derivatives, molecular weights of, 67. Pyrogallol, physiological action 1019. Pyrogallolbenzeïn, 899. Pyrogallolcarbothionylic acid, 163. Pyroglutamic acid, 642. Pyrographitic oxides, 448. Pyromucamide, trichloro-, 601. Pyromucic acid, chloro-derivatives of, - --- dichloro-, 600. - — dichloronitro-, 601. - — dichlorosulpho-, 671. - supposed isomerides of, 1242. Pyromucic acid, \$\beta\$, identity of, with ordinary pyromucic acid, 1242. Pyromucic acids, chloro-, 600. – chlorobromo-, 601. Pyropapaverinic acid, 180. Pyrophosphates, double, use of, in electrolytic estimations and separations, 294.

Pyrotartaric acid and benzaldehyde, condensation of, 775. - and cenanthaldehyde, condensation of, 593. - - and salicylaldehyde, condensation of, 777. - - and valeraldehyde, condensation of, 591. - acids, brominated, 1097. Pyroxene of secondary origin, 1081. Pyrrolidone, 360. Pyrrolidone - derivatives, preparation and properties of, 793. Pyrroline, action of acetone on, 999. action of ethyl and propyl iodides on the potassium derivatives of, 907. conversion of, into its homologues, 1428. - conversion of, into tetramethylenediamine, 1242. tetriodo-, molecular weight of, 906 Pyrrolinecarboxylic acid, α-, molecular weight of, 906. Pyrroline-a-carboxylic acids, nitro-, 66. Pyrroline-derivatives, 263, - action of hydroxylamine on. 1155. from anilidopyrotartaric acid, 642. molecular weight of, 906. - new method of formation of, 1155. - tertiary, 1430. Pyrrolines, action of hydroxylamine on, tertiary, 389. Pyrroylpyruvic acid, imineanhydride of, 1156.anhydride, action of orthophenylenediamine on, 1243, Pyrryl methyl ketone, action of ethyl oxalate on, 1156, 1243. Pyruvic acid, condensation of, with sodium succinate, 1102. - dichloro- and bromodichloro-, 132.

# Q.

Quartz, expansion of, 1372.

— synthesis of, 112.

Quartzine, 712.

Quassia amara, constituents of, 791.

Quassiin, 792.

Quebrachisulphuric acid, 226.

Quebrachite, 226.

Quebracho, sugar from, 226.

Quebrachi derivatives, 64.

Quinaldine, bromo., 1322.

— chloro., 1322.

```
Quinaldine-3: 4'-dicarboxylic acid, 1325.
                                             Quinolinedicarboxylic acid, [2:4-], 176.
Quinazoline-derivatives, synthesis of,
                                             Quinolineparamethenylamidoxime and
                                                its derivatives, 175.
Quinazolines, 1442.
                                              Quinoline paramethenylbenzenylazox-
Quinia morada, constituents of the bark
                                                imeparacarboxylic acid, 176.
  of, 404.
                                              Quinolineparamethenylcarbonylamid-
Quinidine ferrocyanide, 1318.
                                                oxime, 175.
Quinine anhydride, 1166.
                                              Quinolineparamethenylethenylazoxime,

    dextrotropate, 74.

    - estimation of, in quinine tartrate,
                                              Quinolineparamethenyluramidoxime,
                                              Quinolines, nitro-1'-bromo-, 521.
  - ferrocyanide, 1318.
  - first synthetically prepared base
                                                 - substituted, reduction of, 1302.
  isomeric with, 523.

    - — synthesis of, 1142.

Quinoidine, oxidation of, 179.
                                              Quinolinesulphonamide, 1:4-chloro-,
Quinol, chlorodiimido-, 242.
    – chloroparadiacetamido-, 243.
                                              Quinolinesulphonic acid, 1'-bromo-,
  --- chloroparadiamido-, 243.
                                                  ---- 3:1-bromo-, 267.
  — diethyl ether, diamido-, 967.
                                               --- 4:1-bromo-, 267.
 --- ethylxanthate, thio-, 603.
  — metadichloro-, 242.
                                                — — 4: 3-bromo-, 267.
                                              4': 2-bromo-, 266.

4': 4-bromo-, 266.

1: 4-chloro-, 523.
  — physiological action of, 1019.
  --- thio-, 603.
Quinolglycuronic acid, 1286.
Quinoline, action of, on copper sulphate,
                                              ----- acids, bromo-, 265.
  796.
                                               --- bromide, bromo-, 522.
  - 2-bromo-, derivatives of, 173.
                                                --- chloride, 1 : 4-chloro-, 522.
  --- 2'-bromo-, 521.
                                              Quinolinic acid, bromo-, 177.
    - 4-bromo-, derivatives of, 173.
                                              Quinoltetracarboxylic acid, pyrazolone
       4'-bromo-, sulphonic acids
                                                derivative of, 984.
                                                  - anhydride, 984.
  266

    bromo-, La Coste's, constitution of,

                                              Quinolyldiphenylcarbamide, a-, 501.
                                              Quinone, chlorobromonitro-, 1108.
                                                - chloroparadiacetamido-, 243.
  bromo-derivatives of, 1320.

    1 : 2-dibromo-, 173.

    constitution of, 1270.

 - 1: 3-dibromo-, and its derivatives,
                                               — dibromide, 1272.
                                               Etard's nitro-, probable non-exist-
ence of, TRANS., 255.

    1: 4-dibromo-, and its derivatives,

  172.
                                                    halogen derivatives of, Proc.,

    1: 4'-dibromo-, and its derivatives,

                                                1890, 32.
  1320.
                                                   isomeric changes in the halogen

    2: 3-dibromo-, and its derivatives,

                                                derivatives of, Proc., 1890, 32.
  172.
                                                 – metadibromo-, 165.

    2: 4-dibromo-, and its derivatives,

                                              ----- metadichloro-, derivatives of, 241.
  172.
                                               — tetrabromide, 1272.
   - 2 : 4'·dibromo-, 174.
                                               ---- tetrachloro-, 882.
 --- 3: 4-dibromo-, and its derivatives,
                                             Quinonediorthonitrotoluidide, 1446.
                                              Quinonehomofluorindine, 1445.

    3: 4'-dibromo-, and its derivatives,

                                              Quinoneimides, 756, 1265.
  173.
                                             Quinoneorthodinitranilide, 1445.
  --- 4 : 4'-dibromo-, derivatives of, 173.
                                              Quinoneorthonitrotoluidide, 1446.
  --- double salts of, 643.
                                              Quinoneoximes, action of chlorine on,
 --- 4 : 3-nitrobromo-, 267.
 — reduction of, 1302.
                                              Quinoneparamethylphenazine, 1446.
 — reduction products of, 1318.
                                              Quinonephenotolazine, 1446.
  — ring formation, 1004.
                                             Quinones, action of, on orthodiamines, orthonitraniline, and nitroparatolu-
  — tetrabromo-, 1321.
  --- tribromo-, 173, 522.
                                                idine, 1445.
  - 1:4:4'-tribromo-, 1321.
                                                   amido-, 756, 1265.
 ---- trichloro-, 523.
                                                    halogen substituted, action of
Quinoline-derivatives, regularities in the
                                                alkalis and ammonia on, 136.
  oxidation of, 1324.
                                              Quinonetolazine, 1446.
```

Quinoxalines from toluylenediamine and bromacetophenone, constitution of, 524.

**R**., Racemic acid, formation of, by the oxidation of unsaturated acids, 1274. Racemoinosite, 471. Raffinose, 21, 356. — and saccharose, separation of, 732. - compounds of, with bases, 580. --- estimation of, in raw sugar, 301. - fermentation of, with beer yeast, 22. — formation of, 226. formation of lactic acid, 582. - heats of combustion and formation of, 1360. - inverted, behaviour of, with phenylhydrazine, 581. - not formed from cane-sugar, 582. — osazone of, 581. separation of, from molasses, 732. Raoult's law, behaviour of colloid substances with respect to, 105. - method, determination of molecular weights by, Trans., 804. Reaction, influence of glass surfaces on the velocity of, 1208. Reagents, concentration of, 412. Reddingite from Branchville, 1072. Refraction, atomic, of the elements, - equivalent of phosphorus oxide, TRANS., 564. --- molecular, 1. - - determination of, of salts in their solutions, 1033. — of nitrates, 1201.
— of the halogen salts of lithium, sodium, and potassium, 549. of allylbenzene- and propenyl-benzene-derivatives, 748. Refractive energy, molecular, and dis-persive power of aromatic compounds with saturated lateral chains, relation between, 1201. indices of gases, 201. - of normal salt solutions, 549. - — of saline solutions, 673.
- of salt solutions, 202. — power of salts in solution, 1033. of solutions of simple and double salts, 433. Rennet-ferment, action of, 1175. Rennin, action of, 1175. Resazurin, 156. Resin, distillation of, in a vacuum,

1154.

Resins, analysis of, 1032. Resistance, internal,  $\mathbf{of}$ batteries. measurement of, 315. - of electrolytic cells, 317. Reso-orceïn, 1407. Resorcinol, action of, on egg albumin, - brownish-red dye from, 370. ---- chlorodiamido-stannochloride, 241. --- chlorodinitro-, 241. — dicamphoride, 1427. - diethyl ether,  $\alpha$ - and  $\beta$ -bromo-, 1404. - preparation of, 1404. ---- monocamphoride, 1427. —— physiological action of, 1019. —— symmetrical, dinitro-derivatives of, 241. Resorcinolear both ionylic acid, 163. Resorcinol-dyes, 762. - Weselsky's, 156. Resorcinolglycuronic acid, 1286. Resorufamine, 764. Resorufin, 156. Respiration, human, 914. in the horse during rest and work, 392, 1170. — of entozoic worms, 274. --- of plants, 190. Rest, respiration in the horse during, 392, 1170. Retene perhydride, 385. Rhamnetin, glucoside of, 64. Rhamnodiazine, 355. Rhamnosecarboxylic acid phenyllydrazide, 154. Rhamnosediphenylliydrazine, 1260. Rhamnus frangula, frangulin from, TRANS., 38. Rhodium bases, constitution of, 1213. - double salts of, 1383. nitrites, 1382. Rhodotilite from Sweden, 459. Rice-straw, digestibility of, 546. Ricin, 535. Rings, six-membered, theory of. 1299. Rock-forming minerals, artificial production of, 718. Rocks, disintegration of, 1183. - eruptive, of the Rhone, 115. - used in the manufacture of Chinese porcelain, 461. Rock-salt, Roumanian, 217. Roemerite, 454. Root excretions and their influence on organic matter, 656. Rosaginin, 1316. Rosamines, 157. Rosenbuschite, 1079. Rosindone, 909. Rosinduline, 908.

Rotatory power of carbon compounds, sign and variations of, and their chemical constitution, 722.

 of matezite and matezodambose, 471.

Rubidium carbonate, reduction of, by magnesium, 332.

combining energy of, 108.

heat of combustion of, 679.

Rubrite, 456.

Rum, analyses of, 1195.

Ruthenium potassium nitrites, 17.

Rye meal and bran, detection of, in wheat meal and bran, 302.

Saccharic acid, optical isomerides of, 1389.

Saccharic acid, i-, 1392.

Saccharic acid, 1-, 1392.

Saccharic lactone, acid from, 599.

"Saccharin," analysis of, 94.

· effect of, on the digestion of albuminoïds, 1450.

Saccharinic acid phenylhydrazide, 154. Saccharomyces ellipsoideus, preparation of, 1179.

· exiguus, 951.

Saccharose, separation of raffinose from,

Saccharoses, benzoyl-derivatives of, 578. Safrole, 965.

- bromine derivatives from, 638.

— oxidation of, 136.

Salicenylamidoxime and its derivatives,

Salicenylbenzenylazoxime, 143.

Salicenylethenylazoxime, 143. Salicenylethylamidoxime, 144.

Salicenylphenyluramidoxime, 144.

Salicenylpropenylazoxime-w-carboxylic acid, 146.

Salicenyluramidoxime, 144.

Salicylaldehyde and ammonia, action of, on diacetyl, TRANS., 10.

and pyrotartaric acid, condensa-tion of, 777.

- diphenylhydrazone, 1260.

- reaction of, with albumin, 1350.

Salicylamide, dibromo-, 141.

- reduction of, TRANS., 957.

Salicylamine, 1411. Salicylbenzidine, 1298.

Salicylic acid, action of nitrogen iodide on, 1402.

-action of phosphorus trichloride on, 53.

- amido-, action of aniline on,

--- commercial, impurities in, 88.

Salicylic acid, detection of, in wine, 1475.

dichloro-, 1418.
nitrogen derivatives of, 141. — camphoride, 1428.

Salicylometaphenylenediamine, 139. Salicylometatoluylenediamine, 139.

Salicylonitrile, preparation of, 141, 146.

- polymerides of, 146.

Salicylophosphorus chloride, 53.

Salicylothiamide, 141.

- dibromo-, 142.

Saline mixtures, solubility of, 442. Saliva, detection of nitrous acid in,

Salivary secretion, influence of nicotine and atropine on, 397.

Salt-deposits, Stassfurt, occurrence of hydrogen sulphide and sulphur in, 336.

Salts, change of volume on dissolving, in water, 844.

-containing water, dissociation of, and the constitution of the combined water, 206.

— dissolved, voltaic energy of, 317.

- estimation of water and carbonic acid in, 417. formation of, in alcoholic solution,

- fused and solid, electrical con-

ductivity of, 1037. — influence of, on clotting, 1176.

- inorganic, influence of, on the development of frogs' spawn, 393.

 residual affinity of, 444. - in solution, refractive powers of, 1033.

- metallic, action of sulphur on, 9. — — electromotive force of, 843.

— reciprocal influence on the solubility of, 3.

 simple and double, refractive power of, 433

 stability of, alone and in presence of water, 1361.

- substitution of, in mixed solutions, 443.

- sudden changes in the solubility of, caused by the formation of two layers in the liquid, 4.

Salt-solutions, dilatation of, 318. - refractive indices of, 202;

**54**9. – supersaturated, sp. gr., sp.

heat, and heat of dissolution of, 1042. Samarium oxides, new fluorescences of,

Sandmeyer's reaction, improvement in,

Santoninoxime and its derivatives, 902. Santoninphenylhydrazone, 904.

Saponification, method for, 1474. Sapphirine from Fiskernäs, Greenland, 19.

Sarkinite, crystals of, 715.

Sassafras oil, the phenol contained in, 1111.

Scatolacetic acid, 78.

Scatole in the vegetable kingdom, 191. Scheelite, method for the analysis of,

420.

Scopolia atropoïdes, constituents of, 658.

Scopolia carnicola, chemical constituents of, 402.

Scutellarin, 64.

Sealing tubes under pressure, 941.

Sea-mud of the alluvia of the Zuiderzee, 822.

Sea-water, solubility of some substances in, 719.

Secretion of amidic substances, effect of feeding on the, 278.

Seed, resting and germinating, genesis of two varieties of diastase in the, TRANS., 505.

Seeds of the corn cockle, poison of, 1458.

— sugar-yielding, insoluble carbohydrates in, 544.

utilisation and transformations of alkaloïds during the germination of, 543.

Selenic acid, preparation, properties, and reactions of, 688.

Selenious acid, physiological action of, 542.

Selenium and oxygen derivatives of benzene, 34.

— chlorides, vapour densities of, 558. Selenocarbamides,  $\psi$ -, 880.

Selenocyano-derivatives, 949.

Semithiocarbazides, Trans., 257.

—— relations between the solubilities and melting points of, TRANS., 264. Senegin, from Polygala senega, 262.

Senegin, from Polygal Seneginin, 262.

Serpentine from Finland, 715.

from Montville, New Jersey, 716. Sesame oil, testing, 90.

Sewage, estimation of ammonia in, 1024. Silage, preparation of, 546.

Silica, a new form of, 569.

- action of magnesium on, 1374.

— and its compounds, behaviour of, in fused microcosmic salt, 825.

---- estimation of, 194.

---- estimation of, in silicates, 1026.

---- expansion of, 1371.

influence of, on the decomposition of potassium chlorate, Trans., 276.

new forms of crystallised, 712. Silicates, analysis of, 1027.

Silicates, behaviour of, when fused with phosphates, 84.

containing tin and titanium, analysis of, 666.

— formation of, 113.

--- formulæ of, 219.

Silicic acid as a culture medium for organisms, 1338.

— acids occurring in minerals, 342.
Silicon bromide, compounds of, with ammonia and hydrogen phosphide, 559.

- preparation of, 108.

compounds of, with magnesium, 1373.

—— fluoride, combination of hydrogen phosphide with, 448.

— influence of, on steel, 567.

--- nitride, 108.

---- preparation of, 108.

- sesquichloride, combination of ammonia and hydrogen phosphide with, 690.

Silk, thermochemical properties of, 553. Sillimanite, production of, 1074. Silver, allotropic forms of, 210, 334.

— and the alkali metals, isomorphism of the chlorates of, 1208.

- antimonate, 216.

- atomic weight, &c., of, 561.

---- benzamide, 491.

carbonate and oxide, action of magnesium on, 333.

--- carbonylferrocyanide, 117.

— chloride, action of light on, 213.

--- chloride, darkened, not an oxy-chloride, 335.

---- chromiodate, 1378.

--- cyanide, action of cupric salts on, 464.

---- dibenzamide, 1289.

effect of, on the freezing point of tin, TRANS., 377.

electrolytic estimation of, 294, 1029.

 electrolytic separation of, from arsenic, molybdenum, and tungsten, 1029.

- electrolytic separation of, from copper, zinc, nickel, and cobalt, 664.

- formanilide, 1414.

- haloïd salts of, effect of the spectrum on, 933.

— iodide, fused and solid, transfer of ions in, 317.

---- malonate, 1397.

metallic, detection of, in presence of lead, 826.

- Silver metanitrobenzamide, 973. - nitrate, isomorphism of, with the alkali nitrates, 328. - oxide, influence of, on the decompotassium chlorate, position  $\mathbf{of}$ Trans., 279. - salts, action of sodium thiosulphate on, 694. — silicate, 849. ---- sub-fluoride, 1055. Silver-bismuth-glance, artificial, 710. Silver-carbamide, action of iodine on, Slags, estimation of phosphoric acid in, **292**. Soap, estimation of fatty acids in, 1475. - lyes, estimation of glycerol in, 423. --- solution, standard, preparation of, - test, Clarke's, 421. Soda, commercial caustic, volumetric estimation of sodium carbonate and hydroxide in, 293. — natural, or urao, 340. - or potash and carbon, use of, in analysis, 1027. Sodalite, formation of, 1080. Sodammonium, 210, 450, 560, 679. - heat of formation of, 319. Sodionitrethyl alcohol, 858. Sodiophenylmercaptide, behaviour of, with isobutylene bromide, 962. Sodium alum, 1059. - and potassium chlorides, simultaneous solubility of, 103. - - solubility of mixed, 442. arsenate, action of, on sesquioxides. - benzenesulphoncyanamide, 501. --- benzylthiosulphate, 1419. --- borneol camphorate, 790. -- cadmium thiosulphate, 1057. --- carbonate and hydroxide, volumetric estimation of, in caustic soda, 293. crystalline, and chlorine, direct preparation of, from sodium chloride, 10. - - reduction of, by magnesium, 332. – carbonylferrocyanide, 117. chloride, molecular refraction of, in water, 1033. - - violet flame produced by, in à coal fire, 1202. - combination of ammonia with, 209. - dibromoparaxylenesulphonate, TRANS., 978. - effect of, on the freezing point of tin, Trans., 380.
- Sodium erythroxide, heat of formation of, 935. preparation of, 935. - hydroxide, compound of, with isobutyl alcohol, 1222. hydroxymethylenesulphonate, 1092. — iron sulphide, 215. lead chromates, 1065. molecular refraction of the halogen salts of, 549. - nitrate and ammonium sulphate, comparative manurial value of, 287. — nitroprusside, reactions of, 198. — orthoxythiovanadate, 1381. ---- orthoxytrithiovanadate, 1381. ---- perchlorate, properties of, 333. phosphate, influence of, on the excretion of uric acid, 397. - - presence of magnesium in, 664. – phosphites, 438. — pyrophosphite, 438. — rhodium nitrite, 1382. — ---- sulphite, 1383. sesquicarbonate, 340. succinate, heat of formation of, 320. — sulphate, analysis of, 194. - - from Arizona, 572. sulphide, commercial, technical analysis of, 84. - ac.-tetrahydro-β-naphthylearbonate, 507. - ac.-tetrahydro-β-naphthylxanthate, - thiosulphate, action of, on metallic salts, 12. action of, on silver salts, - - behaviour of, towards acids and bases, 10. --- triiodate, 107. - urate, thermochemistry of, 1041. xylenesulphonate (para), Trans., Soil, arable, causes of the exhaustion of, by cropping without manures, 406. · influence of the composition of, on the physical properties of plants, 81. - loss and gain of nitrogen by, 1023. - nitrogen, influence of gypsum and clay on the conservation of, 545. Soils, arable, formation of, 1183. — atmosphere in, 81.
  — composition of, 1339.
  — cultivated but unmanured, exhaustion of, 1459. decomposition of organic manures in, 1183. - estimation of potassium and humus

in, 668.

Soils, estimation of water, humus, sulphur, &c., in, 832. - moorland and peat, examination of, 192. - of Deli, Malang, and Rembang, 823. - vegetable, absorption of ammonia from the air by, 821, 822. Sobrerol, Proc., 1890, 100. Sobrerone, Proc., 1890, 100. Soja bean, white, analysis of, 192. Solaneïne, 75. Solanidine, 75. —— in potato-shoots, 1182. Solanine, 75. - reaction of, 310. Solanum tuberosum, bases contained in the young shoots of, 75. Solubility and heat of fusion, relation between, 686. - influence of one salt on the, of another, 3. - of salts, sudden changes in the, caused by the formation of two layers in the liquid, 4. - simultaneous, of sodium and potassium chlorides, 103. Solution, dissociation of substances in, molecular weight of metals in, TRANS., 376, 656. — of carbonates in acids, rate of, 843. --- theory of, 3. Solution-compounds, 941. Solutions, aqueous, dispersive power of, vapour pressure of, 323. ---- colloïdal, freezing of, 685. — constitution of, 1044. ---- determination of the vapour pressures of, 1364. - exceptions to the gaseous laws in, -freshly prepared, change of electrical conductivity in, 204. — homogeneous, equilibrium in, when unequally heated, 444. - in acetic acid, vapour pressures of, **554**. isomeric, molecular constitution of, 207. - law of the freezing points of, Proc., 1890, 9. mixed, electrolysis of, 317. - mixed, substitution of salts in, 443. — nature of, 845, TRANS., 64.

— nature of, as elucidated by the freezing points of sulphuric acid solu-

tions, TRANS., 331.

- rise of, in capillary tubes, 684. - saline, dilatation of, 318.

Solutions, salt, refractive indices of, 202. – solid, 1044. — supersaturated, 333. - the question of free ions in, 325. --- theory of, 845. Solvent, lowering of the freezing point of, 846. Sorbin, hydrogenation of, 1389. Sorbite, 21. - action of cuprammonium sulphate on, 21. — benzoic acetals of, 730. conversion of glucose into, 1389. Sorghum-cane, organic acids in, 819. Spangolite, 1073. Sparteine ferrocyanide, 1318. Specific gravity apparatus, 206. - — of ammonia solutions, 107. — of supersaturated salt solutions, 1042. -- heat of supersaturated salt solutions, 1042. - heats, experimental determination of the ratio of, in superheated steam, 205. --- inductive capacity of water, 203. --- volume of aqueous vapour, 207.
--- of phosphorus, Trans., 562. --- volumes of camphor and borneol, **16**9. - - of some ethereal salts of the oxalic acid series, 102. Spectra, absorption-, of oxygen, 675. line-, of the elements, structure of, 674.— of gases at low temperatures, 313. Spectrum, absorption-, of ζ-invertan, Trans., 912. — of nitrosyl chloride, 97. - effect of, on the haloid salts of silver, 933. - emission-, of ammonia, 97. — of fluorine, 329. Sphærolite tachylite from the Ussuri district, 461. Spirituous liquors, examination and valuation of, 1194 Spleen, function of, 184. - of young animals, quantity of iron in, 185. Splenic vein, is free hæmoglobin present in the blood plasma of the?, 1016.Stachyose, 1089. Stachys tuberifera, carbohydrate from, --- nitrogenous constituents of the tubercles of, 1183. Stannic chloride, electrical and chemical properties of, 1065. - - freezing point of, 331.

Stannous chloride, action of sulphur on, 9. Starch, digestion of, 537. - estimation of, in fodders, 1197. - estimation of, in grain, 928. - formation of, in the green plant, from certain organic substances, 1021. - growth of excised embryos on, TRANS., 489. - in the endosperm, functions of, TRANS., 478. - reserve, changes of, in the growing embryo, TRANS., 513. --- form in which, enters the embryo, Trans., 513. - ungelatinised, action of diastase of secretion on, TRANS., 510. Starches, saccharification of, by acids, Steam, superheated, experimental determination of the ratio of the specific heats in, 205. Stearic acid, bromo-, 1396. - --- chloro- and dichloro-, 1396. Stearin, beef, testing lard for, 428. Stearone oxime, Trans., 539. - - preparation of, Trans., 537. Steel, aluminium, analysis of, 1471. - estimation of chromium and copper in, 85. - estimation of free and combined carbon in, 1027. - estimation of minute quantities of aluminium in, 548. estimation of sulphur in, 1463, 1464. influence of foreign metals on the properties of, 566. — nature of, 215. relation between the atomic volume of foreign metals and their influence on, 567. Stereochemical isomerism of asymmetrical monoximes, 1263. - research, results and aims of, 719. – studies, 602. - in the piperazine group, 1331. Stereochemistry of ethane-derivatives, 1083. - of nitrogen, 1330. — of nitrogen compounds, 575, 951, Stibiatil, 1076. Stilbazole, metamido-a-, 1438. metanitro-a-, and its reduction products, 1437. Stilbazolene, metamido- $\alpha$ -, 1438. Stilbene, derivatives of, 783. formation of, 978. Stilbene-group, isomerism in the, 1299. Straw, composition of, 1459.

Straw, method for the analysis of, 1460. Strawberries, analyses of, 659. Straw-gum, 1460. Strontia raffinose, 580. Strontium and barium, separation of, 826, 924. - cadmium thiosulphates, 1058. - chlorate, and the velocity of its decomposition by heat, 696. - oxide, action of magnesium oxide on, 452. - crystalline, 850. ---- plumbate, 561. - silicofluoride, solubility of, 925. - thiosulphate, 330. Strophanthin, properties of, 262. Strophanthus hispidus, 262. Strychnine, 1328, 1447. — amidobromo-, 1329. - dihydroxide, 1448. ---- ferrocyanide, 1318. ---- methiodide, α-bromo-, 1329. - --- nitrobromo-, 1329. methohydroxide, nitrobromo-, 1329. Stylophoron diphyllum, alkaloïds of the root of, 649. Suberonyl alcohol, 728. Suberonylene, 728. Sublimates, saline, at Vesuvius, 570. Substitution-phenomena, dependence of, on the atomic or molecular weights of certain atoms or groups, 484. Succinenediamidoxime, 125. Succinenediazoximedibenzenyl, 125. Succinenediuramidoxime, 125. Succineneimidodioxime, 125. Succinic acid and acetaldehyde, condensation of, 584. - and anisaldehyde, condensation of, 770. - - and butaldehyde, condensation of, 588. and chloral, condensation of, 586. - and isobutaldehyde, condensation of, 589. - - and propaldehyde, condensation of, 587. - - and valeraldehyde, condensation of, 590. heat of dissolution of, 320.
series, theory of anhydride formation in, 741. — acids, substituted, 237. anhydride-formation and intramolecular change of, substituted,

chloro- and bromo-, 363.
——mono-, di-, and tri-substituted,

preparation of, 742.

Succinic acids, substituted, electrical conductivity of, 1038.

- chloride, constitution of, 236.

series, anhydride- formation in acids of the, 479.

Succinimide, thermochemistry of, 1360. Succinylbenzimide, 69.

Succinylethylenephenylhydrazine, 250. Sugar, absorption of, from the small

intestine, 276.

- brain-, identity of, with galactose, 121, TRANS., 57.

- cane-, action of invertase on, TRANS., 843.

- - formation of, in etiolated plant shoots, 282.

- formation of lactic acid from, 582.

- - influence of temperature on the specific rotation of, 579.

- transformation of, into dextrose, 21.

- changes in, in the muscle during work, 185.

— detection of, in urine, 427.
— estimation of the mineral matter in, 670.

- formation of paralactic acid in the fermentation of, 78.

---- from fucus, 1105.

from the Quebracho, 226.

- in the blood and in the chyle,

- in urine, estimation of, by fermentation, 836.

- in urine, substances likely to be mistaken for, 279.

- inversion of, 1085.

- invert-, alcoholic fermentation of, 950.

estimation of, 836.

- polariscopic estimation of, in sweet wines, 426.

- presence in chyle of a ferment which destroys, 810.

raw, estimation of raffinose in, 301.
rôle of, and development of, during

the growth of the beetroot, 1020.

- value of the phenylhydrazine test for, 835.

- with an aromatic nucleus, 244. Sugar-group, acids of the, 1398.

- general account of recent research on, 1223.

- reduction of acids of the, 597.

syntheses in the, 1223.

Sugars, analysis of, 301.

- and furfuran-derivatives, relation between, 33.

 behaviour of hydroxides of calcium and the alkalis with, 579.

Sugars, estimation of ash in, 1472.

- estimation of, with copper potassium carbonate solution, 1031.

 heats of combustion and formation of, 1360.

- multirotation of, 1084.

--- richer in carbon from d.-mannose, 1230.

 synthesised, from formaldehyde, cryoscopic behaviour of, 465. Sugar-yielding insoluble carbohydrates

in seeds, 544.

Sulphanilic acid, action of nascent nitrous acid on, 39.

- --- dibromo-, 165.

Sulphates, alkaline, reduction of, by hydrogen and by carbon, 1053.

Sulphides, alkaline, detection of, 291. aromatic, preparation of, 1292.

- crystalline, from the Mechernich lead works, 338.

- double, of the alkali metals and the heavy metals, synthesis of, 215.

- metallic, obtained in the wet way, composition of, 1216.

— mineral, synthesis of, 709.

oxidation of, by the electrical current, 1342.

Sulphines, 880.

and the different valencies of sulphur, 1234.

- double cyanides of, 880.

Sulphites, estimation of alkalis in presence of, 1468.

Sulphocinchonic acid, 1435.

Sulphonal, physiological action of, 542. Sulphonamic acids, aromatic, 1137.

Sulphonation with potassium hydrogen sulphate, 1149.

Sulphoneyanamides, 501.

Sulphonecarboxylic acids, analogy of ketonic acids to, 781.

 reaction of, 781. Sulphones, decomposition of, 987.

derivatives of, 379.

-- preparation of, 780.

Sulphonic acid-group, displacement of the amido-group by, 1137.

Sulphonic - derivatives, action of heat on a mixture of sulphuric acid and,

Sulphophenylazo-ar.-tetrahydro-a-naphthol, 509.

Sulphophenylazotetrahydroguinoline, 1302.

Sulphur, action of, on solutions of metallic salts, 9.

- and carbon, simultaneous estimation of, 290.

- behaviour of, in the organism, 812. - combustion of, at high pressure, 1050.

Sulphur, dissolved, molecular weight of, 447. - estimation of, in burnt pyrites, 193. estimation of, in organic sulphides, 1187. estimation of, in iron, 921. - estimation of, in iron and steel, 1463, 1464. ---- estimation of, in organic compounds, 289. estimation of, in pyrites, 413. - heat of combustion of substances containing, 1361. - in carbon compounds, oxidation of, 1462. - in coal, estimation and occurrence of, 414. — igniting point of, 849. - occurrence of, in the Stassfurt salt deposits, 336. rhombic, from hydrogen sulphide, - the different valencies of, 1234. — vapour density of, 1365. Sulphur-methæmoglobin, 1013. Sulphuric acid, action of, on antimonious oxide, TRANS., 541. - - combined, volumetric estimation of, 414. - -- compounds of vanadic anhydride with, 336. - dilute, action of zinc on, TRANS., 815. estimation of, in soils, 833. fuming, estimation of sulphuric anhydride in, 414. - hydrates of, Trans., 128. - influence of, on the action of invertase on cane-sugar, Trans., 855. - - isolation of a tetrahydrate of, existing in solution, Proc., 1889, 128. - monohydrate of, TRANS., 130. --- solutions, Trans., 64. - --- densities of, Trans., 69-86, 139-158. ---- electrical conductivity of, Trans., 86-88, 158-160. ---- expansion by heat of, Trans., 114—121, 177—184. - freezing points of. TRANS., 331. - heat capacity of. Trans., 88-94, 160-164.

- - heat of dissolution of,

source of error in the estima-

test for nitrous compounds

TRANS., 94-114, 165-177.

tion of, 1342.

in, 922.

Sulphuric acid, tetrahydrate of, TRANS., 339. volumetric estimation of, 825. anhydride, action of, on anti-monious oxide, TRANS., 541. - --- estimation of, in fuming sulphuric acid, 414. Sulphurous anhydride and phenylhydrazine, compound of, 617. - - influence of, on the dissolution of zinc in dilute sulphuric acid, Trans., 821. Supersaturated solutions, 333. Swimming bladder of fishes, gases in, Syenite-pegmatite veins of the South Norwegian augite and nepheline syenites, minerals from, 1077. Syenites, near Glatz, in Lower Silesia, 1076. Sylvanite from Nagyág, 711. Symphoricarpus racemosa, calcium oxalate in the leaves of, 191. T. Tachylite-sphærolite, from the Ussuri district, 461. Tale, constitution of, 948. Tallow, rapid method for the analysis of, 305. Tanghinin, 171. Tannin, a new reaction of, 896. - action of phenylhydrazine on, 896. - estimation of, by means of iodine, 1348. - estimation of, by permanganate. 430. - from the Slavonian oak, 164.

- function of, in plants, 819. - Gantter's method of estimating, 1477. - in barks, colorimetric estimation of, 1348. — in Indian and Ceylon teas, 820. oxidation of, 1130. —— reaction of, 1275. — volumetric estimation of, 931. - volumetric estimation of, in wines, Tanning materials, lime in, 312. Tannins, 164, 257. ---- physiology of, 186. Tantalum, microscopical test for, 86. Tapeworms, mercury in, 396. Taps, vacuum, TRANS., 958. Tartaric acid, anilides and toluidides of, 1112.- estimation of, in vinegar,

- - estimation of, in wine, 427.

1606 Tartaric diorthotoluidide, 1112. - diparatoluidide, 1113. Tartrate solutions, circular polarisation of, 313. Taurine, heats of combustion and formation of, 1361. Tautomeric compounds, 983. experiments to determine the constitution of, 499. Taxine ethiodide, 650. - the alkaloïd of the yew tree, 650. Teas, Indian and Ceylon, tannin in Tellurium, evidence of the occurrence of a new element in, 434. Temperature in nerves, 536. influence of, on the exhalation of carbonic anhydride, 1334. influence of, on the magnetism of salts of metals of the iron group, 678. - volume and pressure, relation of, in the case of liquids, 321. Terephthalic acid, reduction products of 1130. - preparation of, 1130. Terpene, dextrorotatory, from Pinus cembra, 789.- from the oil of Pinus abies, 789. Terpenes, 1314. Tetrabenzoyltriamidophenol, 371. Tetrabenzylphosphonium iodide, 767. Tetracetylbrazilein, di- and tri-bromo-, Tetracetyldiamidoapione, 1295. Tetracetylparadiamidochloroquinol, 243. Tetradecylaldoxime, 1234. Tetradecylamine, 1234. Tetrahydrobromhydroxyquinoline hydrochloride, 177. Tetrahydrodiphenylphenanthroline, Tetrahydro-a-ethoxynaphthalene, ar.-, 509. Tetrahydromethylfurfuran, 20. Tetrahydronaphthalene, 1146. Tetrahydro-α-naphthalene, ar.-amidoazo-, 1305. Tetrahydro-a-naphthaquinol, ar.-, 1305. Tetrahydro-α-naphthaquinone, ar .-, 1305.Tetrahydronaphthathionine, 1300. Tetrahydronaphthindamine, 1300. Tetrahydro-α-naphthol, ar.-, 508. Tetrahydro-β-naphthol, ac.-, 506. Tetrahydro- $\beta$ -naphthol, ar.-, 627, 633. Tetrahydro-β-naphthyl acetate, ac.-,

– benzoate, ac.-, 507.

— phenylcarbamate, ac.-, 507. Tetrahydro-β-naphthylalmines, ac.-, and

--- chloride, ac.-, 507.

ar.-, 631.

Tetrahydronaphthylenediamine, 1:4-, decomposition of, into its optically active components, 511. Tetrahydro-1: 4-naphthylenedichlorodiimide, ar.-, 1300. Tetrahydrophenylhydroxyketoquinazoline, 70. Tetrahydrophthalic acid,  $\Delta^1$ -, 1280. Tetrahydrophthalic acid,  $\Delta^2$ -, 1279. Tetrahydrophthalic acid,  $\Delta^3$ , 1281. Tetrahydrophthalic acid, A4 cistrans., 1281.Tetrahydrophthalic anhydride, 1280.Tetrahydrophthalic anhydride. Δ²-, 1280. Tetrahydrophthalic anhydride,  $\Delta^4$  cistrans., 1281. Tetrahydroquininic acid, 177. Tetrahydroquinoline, colouring matters from, 1005. Tetrahydroquinolinedimethylanilinethiosulphonic indamine, 1006. Tetrahydroterephthalic acid,  $\Delta^1$ -, oxidation of, 1134. Tetrahydroterephthalic acid hydriodide,  $\Delta^2$  cistrans-, 1134. Tetrahydroxyditolyl, 39. Tetrahydroxyphenyl diethyl ether, 968. Tetrahydroxyquinone, action of orthophenylenediamidiné, on, 1265. Tetrahydroxystearic acid, 363. Tetraisobutyl oxalate, 236. Tetraketohexamethylene, dibromodichloro-, 1271. tetrabromo-, 1272. - tetrachloro-, 1271. Tetraketopiperazines, attempts to prepare, 1164. Tetramethyl oxalate, 236. Tetramethylapionole, 36. dinitro-, 1295. Tetramethylbenzamide, 158. Tetramethylbenzidine, 138. Tetramethyldiamidoquinone, preparation of, 757. Tetramethyldihydropyridine, action of methyl iodide on, 67. Tetramethyldiphenyline, 167. Tetramethylenediamine, conversion of pyrroline into, 1242. Tetramethylethylene, action of chlorine on, 727. Tetramethylhexaphenyl ether, 959. Tetramethylphloroglucinol, action of hydrochloric acid on, 1407. Tetramethylrosamine, 157. Tetramethylsuccinic acid, 132, 479. anhydride, 479. Tetramethylstrychnine dihydroxide,

Tetramethyltricarballylic acid, 747.

Tetraminechromic salts, chloro-, 1213. Tetraminecobalt salts, chloro-, 1214. Tetramyl oxalate, 236.

Tetranaphthylcarbamide, β-, 994, 1311. Tetranilidonaphthalene, 911.

Tetraparatolylamidodimethyleneorthophenylenediamine, 247.

Tetraphenyldiamidodimethylenediphenylenediamine, 246.

Tetraphenyldihydro-orthodiazine, TRANS., 647.

- action of excess of phenylhydrazine on, TRANS., 649. Tetraphenylenefurfuran, Proc., 1890,

Tetraphenylpyrroline, ααβ-N-, TRANS.,

Tetraphenyltetracarbazone, 1268.

Tetraphenylthiophen, 1246.

Tetraphenyluvinone, TRANS., 956. Tetrapropyl oxalate, 236.

Tetrethoxybenzene, 968.

Tetrethyl oxalate, 236.

Tetrethylbenzidinephthalic acid, 1298. Tetrethylphloroglucinols, bromo-, 243.

Tetrethylrosamine, 157.

Thallium ammonium tartrate, circular polarisation of, 314.

- antimony tartrate, circular polarisation of, 314.

effect of, on the freezing point of tin, Trans., 379.

- electrolytic estimation of, 295.

- hydrogen tartrate, circular polarisation of, 313.

- lithium tartrate, circular polarisation of, 313.

oxide, crystalline hydrated, 109.
oxides, action of magnesium on, 694.

--- potassium tartrate, circular polarisation of, 314.

—— salts, physiological action of, 1452.
—— sodium tartrate, circular polarisation of, 313.

– ––– thiosulphate, 12.

 tartrate, circular polarisation of, 313.

Thenardite, 456.

Thermal behaviour of cupric chloride solutions, 1206.

expansion of phosphorous oxide, TRANS., 560.

Thermochemical properties of silk, 553. · value of the hydroxyl and carb. oxyl groups in the aromatic series, influence of certain groups on, 439.

Thermochemistry of allotropic forms of arsenic, 679.

- of hydroxylamine, 934.

- of methyl alcohol and solid methyl salts, 100.

Thermochemistry of nicotine, 101.

of some organic acids, 99.

- of wool and cotton, 939. - use of aluminium amalgam in,

110.

See also Heat.

Thermoelectric forces at the surface of contact of a metal and a fused salt,

Thermometer, platinum, TRANS., 657. Thermometers, mercurial, determination of fixed points on, TRANS., 656.

Thermometric readings, correction of,

Thioarsenates, 1053.

Thiocarbamide, action of allyl bromide on, Trans., 299.

- action of benzyl chloride on, TRANS., 284.

conversion of, into carbamide, 1399.

Thiocarbamides, action of hydroxylamine and its derivatives on, 1126. aromatic, derivatives of, 526.

 pseudo-, 159.
 chemistry of, Trans., 283. Thiocarbamidocresol, 248.

Thiocarbamidocumenol, 249.

Thiocarbamidouaphthol, 248. Thiocarbamido-a-naphthol, 249.

Thiocarbamidophenanthrol, 249. Thiocarbanilide, constitution of, 500. Thiocarbanilotoluyleneoxamethane,

Thiocarbanilotoluyleneurethane, 1125. Thiocyanamidocinnamic acid, 1123.

- meta-, 1124.

Thiocyanates, alkaline, detection and estimation of chlorine in, 663.

formation of, from amido-compounds, 749.

--- gravimetric estimation of, 424. Thiocyanic acid, coloration of organic substances by, 726.

new reaction of, 424.

Thiocyanobutyronitrile,  $\gamma$ -, 1221. Thiocyano-derivatives, 949.

Thiocyanopropylphthalimide, y-, 472,

Thionylparatolylhydrazone, 617.

Thionylphenylhydrazone, 617. Thiophen, heats of combustion and formation of, 1361.

preparation of, 1400.

Thiophen-derivatives, conversion of pentamethylene-derivatives into,

Thiosulphates, 210, 330, 564, 1057. Thiosulphuric acid, detection of, in urine, 812.

Thiovanadates, 1381.

Thioxanthone, preparation of, 1292.

Thoria minerals from Llano Co., Texas, Thorium and uranium, new case of isomorphism of, 15. ---- sulphate, 15. - and its hydrates, solutionequilibrium of, 686. Thoro-gummite, 458. Thrombogenic enzymes, TRANS., 531. Thrombogens, TRANS., 531. Thymol, bromo-, derivatives of, 366. - bromonitro-, and dinitro-, constitution of, 753. — derivatives of, 883. --- dinitro-, 602. - ethyl ether, amidobromo-, 883. ---- orthobromo-, 883. --- nitrobromo-, 366. --- nitro-derivatives of, 602. - nitroso-, action of hydroxylamine - paramido-orthobromo-, 602. ---- paranitro-orthobromo-, 602. Thymoleinnamic acid, 892. Thymolglycuronic acid, 1286. Thymoquinone, chlorhydroxy-, constitution of, 884. Thymoquinones, bromo-, 367. - halogen, isomerism of, 367. — isomeric chloro- and bromo-, constitution of, 753. Thymyl phenylcarbamate, 760. Tiglamide, chloro-, 958. Tiglic acid, derivatives of, 862. Tin and titanium, separation of, separation and estimation of, 666. copper and lead, alloy of, 335. - detection of, in minerals, 830. — double phosphates, 1379. - effect of various metals on the freezing point of, TRANS., 376. - electrolytic estimation of, 294. - estimation of lead in, 665. - eutectic alloys, TRANS., 386. - lead and zinc, alloys of, 336. - mineral in process of formation, ore, analysis of, 1027.
oxide, influence of, on the decomposition of potassium chlorate, TRANS.,  $\bar{2}76.$ precipitation of, from acid solutions by metallic iron, 853. - tetraphenyl, 166. Tintometer, 1461. Titanic anhydride, crystallisation of, Titanium and tin, separation and estimation of, 666. - --- separation of, 1029.

Titanium dioxide, action of magnesium and hydrogen on, 1375. - reduction of, by magnesium, 1374. chloride, action of, on metals, 1066. - double phosphates, 1379. Tobacco, causes of the fertility of the forest land of Deli for, 1340. — estimation of nicotine in, 430.
— influence of the ash constituents on the combustibility of, 1458. - leaves, composition of the ash of, Tolane, chlorine compounds of, 899. dichlorides, 783. Tolidinedisulphonic acid, ortho-, 60. Tolidinesulphone, 60. Tolidinesulphonic acid, ortho, 60. Toluamide, ω-chloropara-, 239. Toluanilide, para-, 759. Tolubenzylacetamide, para-, 969. Tolubenzylamine, ortho- and para-, derivatives of, 968. Tolubenzylcarbamide, para-, 969. Toluene, action of lead oxide on, 962. - nitro-derivatives of metabromo-, 485. parachloro- and parabromo-, melting point of, 3. physical constants of halogen derivatives of, 2. Tolueneazo -  $\beta$  - naphthylphenylamine, Toluenecyanosulphochloride, 382. Toluenecyanosulphonic acid, 382. Tolueneoxamethane, 1124. Toluenesulphonic acid, diamido-, 502. Toluic acid, ω-chloropara-, 239. — acids, isomeric paranitro-, 52. Toluidine malate, ortho-, 1163. Toluidine, para-, action of bromine on, in presence of sulphuric acid, 137. estimation of, 839. oxalate, 137. Toluidines, ortho- and para-, action of nascent nitrous acid on, 38. - chlorination of, and bromination of, in presence of an excess of a mineral acid, 37. physiological action of, 1018. Toluidinesulphonic acid, ortho-, action of nascent nitrous acid on, 39. acids, nitro-, 502. Toluidobenzoicacid, metanitropara-, 374. Toluidonaphthaquinone, nitro-. 1447. Toluidonaphthaquinoneditoluidide, 910. Toluidotoluquinone, nitro-, 1446. Toluphenanthrazine, bromo-, 976. Toluquinaldine hydrochloride, ortho-, Toluquinone, nitranilido-, 1446.

Toluylamide, ortho-, reduction of, TRANS., 957. Toluylchlorisoquinoline, 3: 1-meta-, Toluylene semiurethane, 1125. Toluyleneamidinebenzenylorthocarboxylic acid, 969. Toluylene-blue, 1114. Toluylenecarbamide, bromo-. 975. Toluylenediamine, bromo-, 970. Toluylenediorthotolylamidine, amido-, 371. Toluylenediurethane, 1124. Toluylene-red, 1114. Toluyleneurethane, 1124. Tolyl benzyl ketone, para-, bromoderivatives of, 260. oxidation of, 260. - dibromomethyl ketone, para-, 769. ---- ethylxanthates, ortho-, meta-, and para-, 603. methyl acetoxime, para-, 769. --- ketone, 769. - pinacone, para-, 769. - phenyl ketone, para-, stereochemically isomeric oximes of, 1273. - phenylcarbamate, ortho- and para-, - symmetrical dithiocarbonate, para-, 603. - thiocyanate, ortho-, 750. - thiocyanate, para-, preparation of, Tolybenzyloxythiocarbamide, ortho-, 1127. Tolylcyanamide, ortho-, 1127. Tolyldihydroquinazoline, para-, 73. Tolyldihydroquinazoline, ortho-, 74. Tolyldiphenylpyrroline, ortho-, 263. Tolyldiphenylpyrrolinecarboxylic acid, ortho- and para-, 263. Tolylenecarbamide, 760. Tolylglycin, ortho-, 1285. Tolylglycin, para-, derivatives of, 1284. Tolylglycinimide, para-, 1284. Tolylglyoxal hydrate, para-, 52. Tolylhydroxythiocarbamide, ortho-, Tolylimidodiacetic acid, ortho-, 1285. Tolylimidodiacetic acid, para-, 1285. Tolylketodihydroquinazoline, para-, 73. Tolylketone aldehyde, 769. Tolylmethylpropylene  $-\psi$ -thiocarbamide, ortho-, 160.  ${f T}$ olylmethylpyrazoloneketoparatolylhydrazone, para-, 29.  ${f Tolylorthobenzylenediamine},$ para-, Tolylparatoluidide, para-, 759. Tolylparatolyldichlorodiketoparadiazine, ortho-, 526.

VOL. LVIII.

Tolylparatolyldiketodihydroparadiazine, ortho-, 270. Tolylphenyl-aγ-diketopiperazine, para-, 1284.Tolylphenylketoxime, para-, 503. Tolylphenylsemithiocarbazide, ortho-, Trans., 258. Tolylpropylene-\psi-thiocarbamide, ortho-, Tolylrosinduline, para-, 909. Tolylsulphonepropionic acid, a-para-, Tolyltetrahydroquinazoline, para-, 73. Tourmalin-bearing copper ores from Chili, 114. Translocation, diastase of, Trans., 509. Transpiration and assimilation, relation between the, produced by chlorophyll, Triacetonetrisulphone, 26. Triacetylbrazileïn, dibromo-, 997. Triacetyldiamido-β-naphthol, 1424. Triacetylmoradin, 405. Trianilidobenzene, bromotrinitro-, 982. Trianilidonaphthalene, 911. Triazine-derivatives, synthesis of. Trans., 328. Tribenzoyldiamido-\(\beta\)-naphthol, 1424. Tribenzoyltriamidobenzene, 370. Tribenzylphosphine, 767. Tribenzylphosphine oxide, identity of Hofmann's dibenzylphosphine with, Tributylbenzene, tertiary, 1297. Tricarballylamide, 134. Tricarballylanilide, 133. Tricarballylates, 480. Tricarballylic acid, 183. ---- dibromo-, 594. — Guinochet's isomeric, 595.
— isomeride of, 238. - acids, attempts to prepare alkylsubstituted, 747. - chloride, 133. Tricarbanilidohydroxyhydrazobenzene, Tricarbanilidophloroglucinol, 500. Tricyanides, 1252. Tridecylquinoline, [2'-], 1234. Tridymite, 1070. - expansion of, 1371. - synthesis of, 112. Triethyl tricyanide, 726. Triethylamine and ethyl iodide, effect of various solvents on the velocity of reaction between, 1366. Triethylbenzylammonium chloride and hydroxide, action of heat on, Trans., Triethylmethylammonium chloride and

hydroxide, action of heat on, TRANS.,

```
Triethylorcinol ethyl ether, secondary-
  tertiary, 1405,
     secondary-tertiary-, 1405.
Triethylresorcinol ethyl ether, secondary,
     secondary tertiary, 1404.
Triethylthiocarbamide salts, 1241.
Trihydroxytritolylethanes, 1140.
Triketohexamethylene,
                             hexabromo-,
Triketopiperazines, attempts to prepare,
   1164
Trimethyl tricarballylate, 133.
Trimethylacetamidehydroxime, 1388.
Trimethylacetic acid, action of bromine
   on, 1096.
Trimethylallylammonium chloride and
   hydroxide, action of heat on, Trans.,
Trimethylamine, action of, on ethyl
   bromisovalerate, 956.
      compound of, with acetic acid,
Trimethylanthracene, [1:2:4-], 512.
Trimethylanthracene, [3:1':3'-], 513.
Trimethylanthracylene, 512.
Trimethylanthraquinone, [1:2:4-],
   512.
    -dinitro-, 513.
Trimethylanthraquinone, [2:1':4'], 513. Trimethylanthraquinone, [3:1':3'], 514.
Trimethylanthraquinones, nitro-1:2:4-,
Trimethylbenzoic acid, [2:4:5-], 981.
Trimethylbenzoic acid, [2:4:6-], 981.
Trimethylbenzylammonium
                                  chloride
  and hydroxide, action of heat on, Trans., 778.
Trimethyldihydroquinoline, 1292, 1421.
Trimethylene bromide, action of, on
   ethyl sodethylacetoacetate, TRANS.,
   - iodide and aniline, reaction of,
   1164.
  — mercaptan, 949.
 ---- selenide, 950.
  ---- selenocyanate, 959.
---- sulphide, 949.
  ---- tetrasulphide, 1093.
 ---- thiocyanate, 949.
Trimethylene-\psi-carbamide, 473.
Trimethylenediamine, derivatives of,976.
Trimethylenedicarboxylic acid, 736.
Trimethylenephenylcarbamide, 977.
Trimethylenephenyldiamine, 977.
      and its derivatives, 1244.
     - trimethylenephenylthiocarbamate,
   1244.
Trimethylenephenylthiocarbamide, 977.
```

Trimethylenepseudocarbamide, 1090. Trimethylenepseudothiocarbamide,

1090.

Trimethylene- $\psi$ -selenocarbamide hydrobromide, 880. Trimethylenetetracarboxylic acid, 879. Trimethylene-\psi-thiocarbamide, 473. Trimethylenetricarboxylic acid, symmetrical, 1397. Trimethylenetriphenyldithiocarbamide, Trimethylenetrisulphone, 478. Trimethylenimine, 1394. Trimethylethylammonium chloride, action of heat on, TRANS., 768. Trimethylethylidenelactic acid, 237. Trimethyl-2'-ethylquinoline, [1:3:3'-], Trimethylglutaric acid, 480. — anhydride, 480. ---- α-bromo-, 480. Trimethylisoamylammonium chloride and hydroxide, action of heat on, Trans., 774. Trimethylisobutylammonium chloride and hydroxide, action of heat on, Trans., 773. Trimethylisopropylammonium chloride and hydroxide, action of heat ou, TRANS., 772. Trimethylphenylacetamide, [2:4:5-], Trimethylphenylacetamide, [2:4:6-], Trimethylphenylacetic acid, [2:4:5-], Trimethylphenylacetic acid, [2:4:6-], Trimethylphenylammonium chloride and hydroxide, action of heat on, TRANS., 777. Trimethylphenylglyoxylic acid, [2:4:5], 981.Trimethylphenylmethane, 1296. Trimethylphenylrosinduline, 909. Trimethylpropylammonium chloride and hydroxide, action of heat on, Trans., 771. Trimethylpyrrolidine, [1:2:5-], 1001]. Trimethylpyruvic acid, 237. Trimethylquinoline, [3:2':3'-], 1326. Trimethylsuccinic acid, 743, 1099. Trimethylsulphine cyanide, 881. Trimethylthiazole, 1238. Trimethyltrimethineammonium bromide, 357. Trimethyluracil, 31. Triparatoluidonaphthalene, 910. Triphenodioxazine, formation of, 490. Triphenyl phosphite, 34. thiophosphate, 35. Triphenylamidobenzene, 614. Triphenylamine, amido-, and nitro-derivatives of, 1409. Triphenylaminetrisulphonic acid, 1410.

Triphenylbenzene, 1423. – tetramido-, 1423. --- tetranitro-, 1423. Triphenylbenzenedisulphonic acid, 1424. Triphenylbiguanide, 1126. Triphenylbutyrolactone, Trans., 680. Triplienylcarbinol, paramido-, 1141,  $1\bar{1}42.$ - paranitro-, 1141. Triphenylchlorofurfuran, reduction of, Trans., 674. Triphenylcrotolactone, TRANS., 678. - action of bromine on, TRANS., 678. - action of potash on, Trans., 680.
- crystallography of, Trans., 716.
- oxidation of, Trans., 679.
- reduction of, Trans., 679. Triphenyldicarbimide, 1125. Triphenylfurfuran, Trans., 645.

reduction of, Trans., 675.

oxidation of, Trans., 675.

tribromo-, Trans., 713. Triphenylguanylthiocarbamide and dicvanodiamide, 1125. Triphenyl-γ-hydroxybutyric acid, TRANS., 680. Triphenylmethane, oxidation of, 168. – paramido-, 1141. — paranitro-, 1141. Triphenylphosphoryl dichloride, 35. Triphenylpyrazole, TRANS., 710. Triphenylpyrroline, TRANS., 645. Triphenylpyrrolone, TRANS., 694. - crystallography of, TRANS., 720. - reduction of, TRANS., 695. Triphenylsulphonepropane, 988. Triphenylthiammeline, 1126. Triphenylthiophen, Trans., 647. Trisulphones, 55. Trithioacetonedisulphone, 26. Trithioaldehydes,  $\alpha$ - and  $\beta$ -, 25. Trithioaldehydesulphone, 26. Triticin, molecular weight of, 227. Tritolylbenzene, 769.
—— tribromo-, 770. ---- trinitro-, 770. Trona, 340. Tropic acids, optically active, formation Tropidine, conversion of, into tropine, 1167, 1333. Tropine, conversion of tropidine into, 1167, 1333. Tropinic acid, properties and salts of, Truffles, chemistry of, 659, 821. Truxene-derivatives, 514. Truxillic acids, theory of the, 1424. Truxone-derivatives, 514. Tryptophan, 804. Tuberculosis, udder, changes in milk by, 652.

Tungsten, estimation of, in metallic tungsten, 420. influence of, on steel, 567. - oxide, influence of, on the decomposition of TRANS., 276. potassium chlorate, Tungstic acid and vanadic acids, separation of, 666. colloïdal, molecular weight of, 1215. Tungstovanadates, 1066. Tunicin, heat of combustion of, 938. Turanose, 733. Turpentine, estimation of petroleum in, - French essence of, adulteration of, - ordinary, detection of, in Venice turpentine, 307. - oxidation of, in sunlight, Proc., **1890**, 99. production of camphor from, Trans., 961. Turpentineglycuronic acid, 1287. Typhotoxine, Brieger's, 391. Tyrolite from Utah, 853. Tyrosine ethyl ether, behaviour of, in animal metabolism, 187. heats of combustion and formation of, 936.

Tubes, sealing, under pressure, 941.

#### U.

Ulexine, 180. Unibelliferone methyl ether, oximido-, – thio-, 624. Undecylacetylmelitriose, 1085. Uracil, nitro-, alkyl derivatives of, 31, 32.Uramidocinnamic acid, ortho-, 1123. – ––– orthothio-, 1123. Uraninite, nitrogen from, 456. Uranium and thorium, new case of isomorphism of, 15. - carbonylferrocyanide, 117. - oxide, influence of, on the decomposition of potassium chlorate, Trans., 276. phosphates, 1056. - sulphate, 15. Uranyl chromate and its double salts,

- formation of, in the dog-fish, 1451.

heats of formation and combustion of, 206.

origin of in the animal economy.

Urao, or native soda, 340. Urea, estimation of, 308, 931.

origin of, in the animal economy, 184.

Urea. See also Carbamide. Uric acid, ammoniacal fermentation of, - estimation of, in human urine, 1345. - estimation of, in urine, 670. - - heat of formation of, 1040. phate on the excretion of, 397. - the Fokker-Salkowski method of estimating, in normal and pathological urines, 304. Urimidosuccinic acids, molecular weights of, 725. Urine, analysis of, 1199. ----- benzamide in, after administration of benzaldehyde, 188. — cystin in the, 1018. --- detection of sugar in, 427. - detection of thiosulphuric acid, dog's, nitrogenous constituents of, 279. estimation of albumin in, 1199. - estimation of sugar in, by fermentation, 836. - estimation of the potassium in, as hydrogen potassium tartrate, 187. - estimation of total phosphorus in, 825. - estimation of uric acid in, 670. ---- healthy, absence of acetone in, - human, estimation of uric acid in, 1345. nitrogenous constituents of, - normal, ethyl carbamate in the alcoholic extract of, 654. - occurrence and detection of indigored in, 1032. - of the horse, chemistry of, 914. - precipitation of albuminoïds from, 273. proteïds in, 1174. - reducing substances in, 188, 279. - substances likely to be mistaken for sugar in, 279. - the phenylhydrazine test for sugar in, 835. uric acid in, 540. Urines, normal and pathological, estimation of uric acid in, 304. Urobilin in the bile, 187. Uroleucic acid and alcaptonuria, 188. Urtica urens, U. dioca, and U. pilulifera, constituents of, 545.

### ٧.

Vacuum joints and taps, TRANS., 958. Valency, lecture experiment for the demonstration of, 1050.

Valeraldehyde and succinic acid, condensation of, 590.

 and pyrotartaric acid, condensation of, 591.

Valeric acid, γ-bromo-, 585.

- — dibromo-, 58**5**.

Valerolactone, action of sodium ethoxide on, 867.

Vanadic acid and tungstic acids, separation of, 666.

preparation of, 16.

separation of, from phosphoric acid. 1343.

anhydride, compound of, with sulphuric acid, 336.

- influence of, on the decomof potassium position chlorate, TRANS., 276.

Vanadium arsenate, 1380.

— estimation of, 1343.

—— fluorine compounds of, 15.

--- in potassium hydroxide, 706. - oxyfluorides, compounds of metal-

lic fluorides with, 15.

Vanadoarsenates, 1380. Vanadotungstates, 1066.

Vanillin from Rosa canina, 1270.

Van't Hoff's theory, deductions from, 845, 1205.

Vaporisation, heat of, determination of, by means of the steam calorimeter,

Vapour-densities of selenium chlorides,

- of substances below their boiling points, determination of, 440. - density apparatus, Hofmann's, trough for, 681.

-- determination of, 681, 1042.

- — determinations, 1365.

 determinations under reduced pressure, apparatus for, 101.

- - of antimony pentachloride,

pressure of aqueous solutions, 323.

 reductions, determination of molecular weight from, 323.

 pressures of solutions, determination of, 1364.

 of solutions in acetic acid, 554.

Vegetable cell-membrane, composition of, 1457.

Velocity of reaction, influence of glass surfaces on, 1208.

Veratrine, action of alcoholic potash on, 1448.

Veratrine, action of hydrochloric acid Water, estimation of iron in, 419. on, 1449 in, TRANS., 811. — bromides of, 1448. ---- crystallised, 1448. —— dry distillation of, 1449. poses, 298. Vesuvian, composition of, 221. Vinegar, estimation of tartaric acid in, carbonate in, 450. Vinyl alcohol, a constant constituent of of crystallisation, 1209. ethyl ether, 118. - oxymercurochloride, 118. in, 851. Vinylpiperidine, 68. Vinylpyridine, 67. Viscosity of liquids, 441. in, 719. Vitellin, heat of combustion of, 938. Vivianite from the Szentes artesian well, Waters, drainage, 1459. 714.— manganiferous spring, 854. — mineral, of Cransac, 1385. Voltaic cell, Clark, standard, 202. -- mineral, of Malaisie, 1081. - --- silver-mercury, and its relation to temperature, 550. ---- theory of 314. estimating nitrates in, 831, 832. --- cells, electromotive forces of, containing mixed salt solutions, 202. —— energy of aqueous solutions, 941. Wax, examination of, 429. - - of dissolved chemical compounds, 317. of, 1470. Whale, bottle-nosed, milk of, 812. Volume, change of, on dissolving salts in water, 844. - molecular, of organic compounds, Grignon in 1889, 820. formulæ for calculating, 323. ---- law of, 1043. of, in the case of liquids, 321. meal and -bran in, 302. - specific, of aqueous vapour, 207. - mutritive value of, 396. - of phosphorus, TRANS., 562. Wheat-straw, composition of, 1461. Volumes, molecular, of aromatic com-Wiluite, 220. pounds, 683. estimation of glycerol in, 426. W. Wads, 570. in, 427. - statistics of Germany, 285.

Water, action of chlorine on, in the light, Trans., 613. — analysis, 196, 667. statement of results of, 196. — and hydrogen chloride, simultaneous synthesis of, 8. composition of, 330. dissociation of salts containing, 206. distilled, electrical conductivity of, 1357. — estimation of alkalis in, 299. -- estimation of chlorine, 86. estimation of dissolved oxygen in, TRANS., 185. — estimation of free oxygen in, 412. ---- estimation of, in air, 1188. — estimation of, in soils, 832. - estimation of, in salts, 417.

- estimation of nitrates and nitrites - estimation of the hardness of, 86. - examination of, for technical pur- fresh and sea, solubility of calcium - from the Roundwood colliery, 222. ---- ordinary, copper precipitate formed - penetrability of glass by, 691, 692. --- sea-, solubility of some substances specific inductive capacity of, 203. - potable, colorimetric methods of - --- containing magnesium, estimation of carbonic anhydride in, 197. Weldon mud, gas-volumetric estimation Wheat in the experimental plots at - ungerminated, diastatic ferment of, Wheat-meal and -bran, detection of rye-Wine, detection of alkanna red in, 311. - detection of salicylic acid in, 1475. - estimation of potassium hydrogen tartrate, tartaric acid, and malic acid — lees, valuation of, 303. Wines, bouquets of, 1180. colouring matters of, 311. - detection and estimation of lactic and butyric acids in, 1344. influence of yeast on the bouquet of, 281. - raisin and grape, method of distinguishing between, 1031. - raisin, and their richness in nitrogen, 1031. sweet, polariscopic estimation of sugar in, 426. volumetric estimation of tannin in, Winter bark, true, 405. Winterene, 405.

Wintergreen oil, 256.

Wöhlerite, 1079.

Wolframite, analysis of, 1027.

 method for the analysis of, 420. Wollastonite, artificial preparation of,

Wood, products formed in the distillation of, 956.

Wood-fibre, estimation of, in paper,

Wood-gum, from straw, &c., 472. Wool, heat of combustion of, 938.

— thermochemistry of, 939. Wool-oils, analysis of, 305.

Work, Berthelot's law of maximum, and spontaneous endothermic reactions, 681.

- respiration in the horse during, 1170

- muscular, influence of, on the exhalation of carbonic anhydride,

Worms, entozoic, respiration of, 274.

## X.

Xanthone, tribromo-, 893. Xanthoxylon Senegalense, bark of,

Xenotime from South Norway, 1078.

Xylalphthalide, 625.

nitro-, 625.

Xylalpthalimidine, meta-, 625.

· nitro-, 625.

Xylalphthalalnitronitrite, 625. Xylene, dibromodichloro-, 1248.

dibromopara-, preparation and properties of, Trans., 974.

- 4 : 6-dichlorometa-, 1106.

amido-, bromo-, and nitro-derivatives of, 1247.

orientation of, 1246.

---- diiodo-, 1107.

— dinitrodichloro-, 1248.

— dinitroso-, 607.

 iodometa-, action of sulphuric acid on, 1106.

meta-, chlorine substitution products of, 1105.

– tetrachlorometa-, 1106, 1248.

– trichlorometa-, 1106.

Xylenecarboxylic nitronitrosoacid, meta-, 980.

- dinitrosometa-, 980.

Xylenes, dibromo- and dichloro-, and their transformation by means of sulphuric acid, 1247.

Xylenesulphonamide, dibromopara-,

reduction of, Trans., 979.

Xylenesulphonic acid, dibromopara-, Trans., 976.

- acids, para-, Trans., 974.

- chloride, dibromopara-, Trans., 977.

Xylenol, paranitroso-, 607.

Xylenylamidoxime and its derivatives,

Xylenylbenzenylamidoxime, 49. Xylenylcarbonylamidoxime, 50.

Xylenylethenylazoxime, 50.

Xylenylphenylthiouramidoxime, 50. Xylenylphenyluramidoxime, 50.

Xylenyluramidoxime, 50.

Xylidine, para-, 606. Xyloquinol, dichlorometa-, 1247.

Xyloquinone, dichlorometa-, 1247. Xyloquinonedioxime, para-, 607.

Xylose from straw, &c., 472.

- from straw-gum, 1460. - heats of combustion and formation of, 1360.

Xylosecarboxylic acid, 1399.

Xylyl ethylxanthate, meta-, 603.

Xylyl methyl ketone, 3:5-dinitro-, 981. 5-amidometa- and 5-nitrometa-, 980.

- 3-nit**r**ometa-, 980.

Xylyl methyl ketone, ortho-, 770. Xylyl nitrosomethyl ketone, 3:5-dinitro-,

Xylylacetic acid, meta-, 499. Xylylamide, meta-, 975.

Xylylamides, ortho- and meta-, 158. Xylylanilide, 759.

Xylyldiphenylpyrroline, meta-, 263.

Xylylene sulphides, 134. Xylylglycollic acid, meta., 499.

Xylylglyoxylic acid, dinitrometa-, 980.

– dinitrosometa-, 979. Xylylhydrazine, meta-, 1410.

Xylylhydrazinesulphonic acid, sodium salt of, 1410.

Xylylmalonanilide, meta-, 499. Xylylmalonic acid, meta-, 498.

Xylylmethylcarbinol, meta-, 979.

Xylylmethylcarbinol, ortho-, 770.

Xylylmethylsulphine iodide, ortho-,

Xylylphenylacetoximeorthocarboxylic acid, oximidolactone of, 625. Xylyltartronic acid, meta-, 499.

#### Y.

Yeast, alcoholic extract of, 905. elliptical, effect of copper salts on,

- influence of, on the bouquet of wines, 281.

- liquefaction of, TRANS., 869.

Yeast liquor, composition of, Trans., 878.

Yeast-albuminoïd, Trans., 886, 893.

Yeasts, wine, preparation of, 1179.

Yew tree, alkaloid of, 650.

Yolk of egg, detection of the colouring matter of, 840.

 heat of combustion of, 938. Yttria, action of magnesium on, 693.

- minerals from Llano Co., Texas,

--- nature of, 566.

Yttrialite, 458.

Yttrium earths, 851.

- phosphate from South Norway, 111.

# Z.

 $Z_{\alpha}$  and  $Z_{\beta}$ , nature of, 566. - new fluorescences of, 435. Zeolites, composition of, 717. Zinc, action of, on dilute sulphuric acid, TRANS., 815. and copper sulphates, electrolysis of a mixed solution of, 678. and mercury, double cyanides of, interaction of the haloïd salts of, 224. --- antimonate, 216. — arsenate, 563. - crystalline anhydrous, 214. --- cyanide, action of cupric salts on, - dust, valuation of, 1190.

- Zinc, effect of, on the freezing point of tin, TRANS., 382.
- electrolytic estimation of, 294.
- --- electrolytic separation of mercury and of silver from, 664.
- estimation of, in blende containing manganese, 827.
- --- estimation of, in calamine, 418. - estimation of, in iron ores, 1192.
- estimation of, in its ores, 1191.
  - estimation of, in manganiferous flue deposits, 294.
- --- estimation of, in presence of iron and manganese, 1193.
- ---- ethoxide, non-existence of, 482.
  - ethyl, action of oxygen on, 481.
- ---- hydrosulphide, 214.
- lead, and tin, alloys of, 336.
- oxide, action of magnesium on,
- phosphate, crystalline anhydrous, 214.
- ---- potassium arsenates, 563. ---- separation of, from nickel, 418.
- —— sodium arsenates, 563.
  - — thiosulphate, 12.
- volumetric estimation of, 196,
- Zinc-ammonium compounds, 452.
- Zinciferous clays from South West Missouri, 573.
- Zirconia, crystallisation of, 1071. Zirconium, atomic weight of, 705.
- dioxide, action of magnesium on,
- Zuiderzee, composition of the sea mud in the new alluvia of the, 822.
- Zymolysis, 538.